Agency for Health Care Policy and Research
Center for General Health Services Intramural Research

Trends in Hospital Procedures Performed on Black Patients and White Patients: 1980-87

Provider Studies
Research Note

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Abstract

Previous research has identified significant differences in the performance of medical procedures among racial groups. However, most of these studies have been limited to populations from individual institutions, single States, or single payers, or they report on a restricted range of procedures. This study compares rates of all diagnostic and therapeutic procedures received by black patients and white patients discharged from a national sample of U.S. hospitals. This study used discharge abstract data from the Hospital Cost and Utilization Project, a sample of more than 500 short-term, general, non-Federal hospitals in the United States. It is based on a random sample of 20 percent of discharges from these hospitals, totaling 4.7 million discharges with at least one procedure during the period 1980-87. On average, each discharge had 2.3 procedures, resulting in 10.8 million procedures. All procedures listed on the discharge abstract were classified into 1 of 172 mutually exclusive procedure categories. Discharges were weighted to the national level and age- and sex-adjusted through direct methods of standardization.

National estimates of the rates of procedures for black patients and white patients per 100,000 population are presented with confidence interval estimates (CIEs). The estimated annual percent change (with CIEs) summarizes trends over time. Detailed graphs and tables are provided for each procedure category and statistically significant results are summarized. This report is a compendium of information for generating hypotheses and guiding research. A number of differences between black patients and white patients observed in this study are similar to those reported in the literature; other differences identify variations not previously described. Because discharge-level data do not allow for control of alternative explanations of racial differences in procedure rates, such as differences in health status, access to health services, and quality of facilities and providers, the apparent differences identified here should be verified through more focused research.

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Background

Research Notes are derived from research conducted by staff of the Division of Provider Studies (DPS), Center for General Health Services Intramural Research, Agency for Health Care Policy and Research (AHCPR). This note series provides results of analyses on health policy issues important to the Nation's hospitals.

Overview

The major goal of DPS, formerly the Hospital Studies Program, is to understand patterns of hospital behavior, use, and costs—particularly how hospitals are affected by changes in health policies and by innovations in the health care industry. The scope of the program covers both national health policy and local issues that influence major segments of the U.S. hospital market. The national and State databases maintained by DPS can be used for a variety of studies. Some important current issues that can be explored with these data include:

- Effects of major changes in Federal reimbursement policy on hospital behavior, such as numbers of admissions, length of stay, casemix, and profit.
- Results of innovations within the hospital industry, such as the growth of health maintenance organizations and preferred provider organizations, the introduction and diffusion of medical technologies, and the development of hospital alliances.
- Behavioral differences between key groups of hospitals, such as rural and urban, public and private, and teaching and nonteaching.
- Variations in casemix, severity of illness, and medical practice across geographic regions, hospitals, payers, and types of physicians.
- Resource consumption of patients hospitalized for medical conditions of particular policy interest, such as acquired immunodeficiency syndrome (AIDS) and other human immunodeficiency virus (HIV)-related illnesses, Alzheimer's disease, and extreme immaturity among newborns.

The above examples do not exhaust the issues that can be addressed with the databases of the Division of Provider Studies. DPS staff consult with industry experts, public officials, and other researchers in selecting topics for study.

DPS databases

Three major databases support the research of the Division of Provider Studies: (1) the Hospital Cost and Utilization Project (HCUP), a national sample of more than 500 hospitals; (2) the Hospital Cost and Clinical Research Project (HCCRP), a sample of 46 hospitals that enroll patients in clinical trials under the auspices of the National Cancer Institute (NCI); and (3) the State Hospital Data Project (SHDP), a collection of publicly available discharge data sets for hospitals in California, Florida, Maryland, New York, Massachusetts, Vermont, and Wisconsin. The HCUP hospitals were selected according to stratified sampling procedures and provide the basis for national studies of hospital behavior, utilization, and costs. The HCCRP hospitals were sampled by geographic region and type of NCI clinical-trials program to assess differences in the cost of caring for patients in clinical trials versus patients receiving conventional treatments for cancer. SHDP data were collected by State agencies or data centers from all hospitals within their jurisdictions.

Each project is built around a core of hospital discharge abstracts that provide data on inpatient stays. For HCUP and HCCRP, the abstracts are obtained from discharge abstracting companies or directly from hospitals that have their own in-house data processing systems; participating hospitals supplied all discharge abstracts rather than a sample of records. For SHDP, abstracts are obtained directly from the State agencies or data centers. In addition, each project assembles data on hospitals and local communities from a variety of sources. The American Hospital Association (AHA) has provided data since 1970 from its Annual Survey of Hospitals and various special surveys. All three projects also use county-level statistics obtained from the Area Resource File, compiled by

the Health Resources and Services Administration's (HRSA's) Bureau of Health Professions.

Participation in HCUP and HCCRP was voluntary, and about half of sampled hospitals agreed to contribute their data. HCUP data, about 58 million records, cover 1970-77 (HCUP-1) and 1980-87 (HCUP-2). The 5 million HCCRP discharges cover 1980-85. SHDP includes discharges from hospitals in the seven States currently in the project, about 40 million records. Years of data availability vary by State.

For the 1970-77 HCUP-1 sample, financial data were assembled from hospitals' annual Medicare Cost Reports. For the 1980-87 HCUP-2 sample, hospitals authorized release of their financial data from the confidential section of the AHA Annual Survey. The HCUP database also incorporates physician biographical information from the American Medical Association's (AMA's) Masterfile of U.S. Physicians, thus permitting a unique linkage among inpatient records, hospital data, and physician characteristics for about 160 hospitals.

The HCCRP database combines information on patients placed on protocols for new cancer treatments with discharge abstract data so that differences in charges for protocol and nonprotocol patients can be determined and analyzed. Twenty-five data processing centers provided these protocol data sets for the National Cancer Institute.

The databases of DPS allow a variety of studies to be conducted both across types of hospitals and across time. Studies national in scope require the HCUP data. State data can be used to study small-area variations and the hospital market. These databases, augmented by the latest available information, permit comprehensive assessment of factors affecting patterns of hospital use and costs.

Acknowledgments

Financial support for DPS has been provided by the Office of the Assistant Secretary for Health, the Office of the Assistant Secretary for Planning and Evaluation, the National Institutes of Health, and the Health Care Financing Administration (HCFA).

AHCPR contracting arrangements and data confidentiality safeguards preclude the identification of individual hospitals, physicians, or their patients. DPS cannot acknowledge individually the contributions they have made to this research; but without such cooperation, the empirical research published by DPS since 1982 would not have been possible.

AHCPR thanks the following discharge abstracting companies for their timely contributions: Commission on Professional and Hospital Activities, Ann Arbor, MI; McDonnell Douglas Health Information Systems Co., Hazelwood, MO; Health Data Service of Maryland (a subsidiary of Blue Cross and Blue Shield of Maryland), Towson, MD; ServiShare of Iowa, Des Moines, IA; Hospital Utilization Project, Monroeville, PA; Quadax, Inc., Cleveland, OH; Utilization Information Service/Massachusetts Hospital Association, Burlington, MA; Utilization Information Service/Hospital Association of New York State, Albany, NY; Hospital Industry Data Institute, Jefferson City, MO; Shared Medical Systems, Malvern, PA; Commonwealth Clinical Systems, Charlottesville, VA; Infomed Associates, Inc./Rochester Area Hospitals Corp., Rochester, NY; MicroDecision Systems at the Center for Health Affairs, Princeton, NJ; MEDIX/Blue Cross of New Jersey, Florham Park, NJ; Kansas Health Data System/Blue Cross and Blue Shield of Kansas, Topeka, KS; and CHIP of Georgia/Blue Cross and Blue Shield of Georgia, Columbus, GA. In every case, these organizations released discharge abstract data only with the written authorization of the hospitals in the HCUP and HCCRP samples. To protect the confidentiality of participating hospitals, data were sent directly to a data processing contractor. All identifying information was removed from files prior to their receipt by AHCPR. In all cases, data were provided with the understanding that analyses, interpretations, and conclusions would be the sole responsibility of AHCPR.

AHCPR also acknowledges the generous provision of discharge abstract data from State agencies and/or their data processing centers, including the California Office of Statewide Health Planning and Development, Sacramento, CA; the Florida Health Care Cost Containment Board, Tallahassee, FL; the Maryland Health Services Cost Review Commission and the Information Service Center, Baltimore, MD; the New York State Department of Health, Statewide Planning and Research Cooperative System Bureau, Albany, NY; the Massachusetts Health Data Consortium, Inc., Waltham, MA; the State of Vermont, Agency of Human Services, Waterbury, VT; and the Wisconsin Office of Health Care Information, Madison, WI.

In addition to the extensive AHA and AMA data contributions discussed above, other hospital or program files were provided by the Office of Research and the Health Standards and Quality Bureau, HCFA; the Bureau of Health Professions, HRSA; the Association of American Medical Colleges; Abt Associates, Inc.; and the United Hospital Fund.

Several organizations generously shared with DPS the software they developed. They include SysteMetrics, Inc.; Health Systems International; the Health Care Research Department, Blue Cross of Western Pennsylvania; the Commission on Professional and Hospital Activities; the Institute for Health Policy Studies, University of California at San Francisco; and the School of Organization and Management, Yale University.

Data files for HCUP and HCCRP were constructed under the technical direction of AHCPR by SysteMetrics, Inc., Santa Barbara, CA. Data file construction for SHDP and programming support for DPS researchers are provided by Social and Scientific Systems, Inc., Bethesda, MD.

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Additional information on DPS and its databases is available from the Division of Provider Studies, AHCPR, 2101 East Jefferson Street, Suite 500, Rockville, MD 20852; phone (301) 594-1410.

Copies of DPS publications are available from the AHCPR Publications Clearinghouse, P.O. Box 8547, Silver Spring, MD 20907; phone toll free 800-358-9295.

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Trends in Hospital Procedures Performed on Black Patients and White Patients: 1980-87

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Introduction

Two important missions of the Agency for Health Care Policy and Research (AHCPR) are to foster an understanding of variations in medical care and to set priorities for health services research. Although the assessment of variations in medical practice patterns has been motivated to a great extent by small-area analysis (Wennberg and Gittelsohn, 1982; Wennberg, Freeman, and Culp, 1987), the examination of differences in patterns of care among larger population groups can also identify important areas for further investigation.

Variations in hospitalization rates or in the performance of procedures may indicate overutilization or underutilization of health care services, all other things being equal (Paul-Shaheen, Clark, and Williams, 1987). For example, previous research has identified significant differences among racial groups in the likelihood of receiving coronary artery bypass graft (Goldberg et al., 1992), other cardiac procedures (Ford et al., 1989; Hannan et al., 1991; Wennecker and Epstein, 1989), carotid endarterectomy (Maxwell et al., 1989), kidney transplantation (Held et al., 1988; Rogers, 1988), diagnostic and therapeutic services for pneumonia (Yergan et al., 1987), and abortion (Henshaw, 1987). These studies have been limited to populations from individual institutions, single States, or single payers (Health Care Financing Administration, 1990a and 1990b), or they report on individual procedures or a restricted range of procedures.

This report compares U.S. rates of diagnostic and therapeutic procedures received by black patients and white patients during hospitalization, based on a national sample of hospitals. It is one of a series of four publications examining variations over time in hospital discharges. Others (in progress) include:

- All listed procedures by U.S. region (Northeast, North Central, South, and West).
- Principal diagnosis by race.
- Principal diagnosis by U.S. region.

This series of publications provides a longitudinal observation over an 8-year period (1980-87) that permits evaluation of changes over time among different regions and racial groups. Discharges are age and sex adjusted and weighted to provide national estimates of rates per 100,000 population. Point estimates and confidence intervals are presented for the rates for each subgroup in each year, along with a summary measure of change (estimated annual percent change) and associated confidence limits.

Methods

Data source

This study employs data from the Hospital Cost and Utilization Project (HCUP), a national sample of hospitals that provide all their discharge abstracts. The second round of HCUP spans the years 1980-87 and is referred to as HCUP-2. HCUP-2 was designed to represent short-term, general, non-Federal hospitals in the United States with 30 or more beds. Hospitals were stratified to ensure representation along several characteristics thought to be important determinants of hospital behavior. These characteristics included geographic region, urban or rural location, teaching status, type of ownership, and bed size. Within these strata, 1,005 hospitals were randomly selected from the American Hospital Association (AHA) universe

in 1982. Of these sampled hospitals, 664 voluntarily provided data for HCUP-2. Because hospitals entered or dropped out of the sample over the course of the data collection period, the maximum number of hospitals contributing data to this study in any year is 539, or approximately 10 percent of the universe of U.S. hospitals. Details regarding sampling and stratification are provided in Coffey and Farley (1988).

The HCUP-2 sample is not fully representative of the universe of hospitals from which the sample was drawn. HCUP-2 hospitals are, on average, larger than hospitals in the AHA universe, more likely to be teaching hospitals, less likely to be located in the South, and less likely to be investor owned. Despite these differences, HCUP-2 hospitals are not significantly different from the AHA universe in terms of expenses, staffing, length of stay, and urban or rural location (Coffey and Farley, 1988; Lemrow et al., 1990).

Some conditions, such as mental disorders and congenital anomalies, which are often treated in specialty hospitals, are underrepresented in this study because the HCUP sample is restricted to short-term, general hospitals. In addition, because HCUP is limited to hospital discharge abstract data, medical care provided on an ambulatory basis is not represented. Thus, these data will underestimate the rates of certain procedures that can be performed in an outpatient setting.

Each discharge abstract summarizes a patient's hospital stay based on specific information compiled from medical records by trained medical records technicians. The data elements on the abstract document patient characteristics, such as age, sex, and race, and medical information, including specific diagnoses and procedures. HCUP data underwent extensive editing to ensure internal consistency and validity.

Information on race is a data element prone to error in discharge abstracts because of the way it is obtained. Many hospitals collect race information at admission either by observing patients or by asking patients to indicate their race from a list of categories. The fact that many hospitals obtain race by visual observation may result in inaccurate classification of some patients. In addition, although other designations for race (e.g., African-American) may be preferred, this study relies on the coding conventions used on discharge abstracts. It would be inaccurate to revise the racial designation for black patients to African-American because the category, as originally specified and collected, may include patients who are not of African or American descent.

Most hospitals collect data according to the categories of the Uniform Hospital Discharge Data Set. The categories were originally defined in 1972 as white, black, and other (Committee of the Uniform Hospital Discharge Data Set, 1972). The categories were revised in 1979 to represent the following groups: white, black, Hispanic, American Indian or Alaskan Native, Asian or Pacific Islander, and other (National Committee on Vital and Health Statistics, 1980). The categories were revised once again (with public notice in 1985) to include white, black, Asian/Pacific Islander, Indian/Eskimo/Aleut, and other. At that time, an additional separate data element for ethnicity was coded as Spanish origin/Hispanic or non-Spanish origin/non-Hispanic (U.S. Department of Health and Human Services, 1985). As a result of the many changes in the coding of this information, measurement of race has changed over time and varies by hospital.

To examine the potential impact of coding changes over time, the distribution of discharges by race from 1980 to 1987 in HCUP-2 data was examined. Table 1 compares the means from the two years prior to 1985 (when a major coding change occurred) with the two years that follow. While the proportion of discharges of white patients in HCUP-2 decreased by 3.9 percent over this period, that of black patients increased by 2.3 percent. Compared with most other minority groups, black patients constitute the one minority for which hospital discharge data are most consistently collected across the period. Although caution should be used in analyzing longitudinal trends because of coding changes, the relatively stable trends for black patients and white patients suggest that coding has changed to a relatively small degree for these groups; thus, the longitudinal statistics for them are probably reasonable. Furthermore, these patterns of change for the white and black groups in the HCUP-2 database are similar to changes in the general population during this period. From 1980 to 1987, the proportion of white persons in the United States decreased 1.6 percent while the proportion of black persons increased 3.7 percent (U.S. Bureau of the Census, 1989).

Some limitations of HCUP are common to most discharge abstract data. Most discharge abstracts

are not created for research purposes; hence, there may be problems with the reliability and validity of certain data elements. Generally, data on admission date, discharge date, age, and gender tend to be most reliable; diagnosis and procedure data are less accurate (Demlo, Campbell, and Brown, 1978). However, the accuracy of diagnosis and procedure data, particularly principal diagnosis and procedure, has improved since discharge abstracts began to be employed for purposes of reimbursement (Fisher et al., 1992). Other problems inherent in discharge abstract data include inconsistent coding across respondents or over time, missing data, underreporting of socially stigmatized conditions such as alcoholism or drug abuse, and underreporting of minor procedures. Finally, the unit of analysis for HCUP data is the discharge rather than the patient because linking discharge records for a single patient across hospitalizations is currently impossible for all hospitals in HCUP.

Study sample

This study was based on a 20-percent random sample of discharge abstracts from HCUP-2. The study sample consists of 6,797,145 discharges from 1980 to 1987. Approximately 31 percent of discharge abstracts listed no procedure, leaving 4,683,993 discharges with at least one procedure. On average, each discharge had 2.3 procedures, resulting in 10,810,057 procedures across the 8-year period.

Procedure categories

Most hospital discharge abstracts in the United States classify medical conditions and procedures using the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM) (Public Health Service and Health Care Financing Administration, 1980). This uniform and standardized coding system for identifying diagnoses and procedures consists of more than 10,000 condition and 3,500 procedure codes.

For purposes of this investigation, all ICD-9-CM procedure codes were classified into 1 of 172 mutually exclusive categories using the procedure section of the Clinical Classifications for Health Policy Research (CCHPR). A complete description of the procedure categories can be found in Elixhauser, Andrews, and Fox (1993). Most categories represent single procedures; however, some infrequently performed procedures are grouped according to the body system on which they are performed. Appendix A lists all CCHPR procedure categories and their constituent ICD-9-CM codes.

Calculation of procedure rates

In order to provide national estimates of the rates of procedures per 100,000 population, it was necessary to weight HCUP-2 discharges to the national level. Appendix B provides a detailed description of the development of discharge weights and compares national estimates using HCUP-2 data with those from the National Hospital Discharge Survey.

When the morbidity or mortality experience of different population groups is compared, it is possible for differences between the populations to bias these comparisons. Standardization (or adjustment) of rates can be employed to control for possible differences between populations that are due to variations in the distribution of certain underlying characteristics, such as age and sex. In this study, we minimize the influence of age and sex on procedure rates through direct standardization using the 1970 U.S. population as the standard. It should be noted that the choice of the standard population does not affect relative comparisons between subgroups within an analysis.

Direct standardization applies the observed procedure rate for each age-sex group in the study population to the corresponding age-sex group of the standard population to derive uniformly weighted summary rates for comparison purposes. Because adjusted rates are not invariant to the choice of the standard population, it is inappropriate to compare the rates reported here with unadjusted rates or rates adjusted using a different standard population. Appendix C provides a detailed description of the standardization methodology along with an example.

Calculation of confidence intervals for procedure rates

In order to compare rates of procedures for discharges of white patients and black patients in a given year, an estimate of the variance for each rate was calculated and used to derive a 95-percent confidence interval estimate (CIE). The upper and lower limits of these confidence

intervals were then compared to identify important differences. Confidence limits for the rates of procedures that did not overlap were considered indicative of a statistically significant difference and were also used to characterize the nature of that difference.

Consider the following hypothetical example, in which the estimated rate of procedure *P* per 100,000 population for black persons is 260 (95-percent CIE = 245, 275), compared with a procedure rate for white persons of 300 (95-percent CIE = 280, 320). These confidence intervals do not overlap, indicating that the point estimates for the two groups differ significantly ($p < 0.05$). In addition, the upper limit of the interval for black persons is less than the lower limit for white persons, indicating that the rate of procedure *P* is significantly lower among black persons than white persons.

It would have been possible to determine statistical significance by testing the hypothesis that the calculated difference in rates was equal to zero. Such a test would have provided a more precise determination of the significance of the observed differences. However, the comparison of 95-percent confidence limits is a more conservative test and is preferable for easily and quickly assessing important differences in this exploratory investigation.

The reader is urged to use caution when interpreting statistical differences based on the comparison of confidence intervals. For example, comparisons involving large samples permit small differences to be detected as statistically significant. Thus, the clinical importance of the magnitude of the differences must be considered. In addition, multiple statistical testing increases the risk of committing a Type I error (detecting a significant difference by chance alone). Although a smaller alpha level for constructing the confidence intervals would have reduced the risk of committing a Type I error, a 0.05 level was considered justified given the exploratory nature of the investigation. Moreover, sufficient information is provided in the tables for reconstructing confidence intervals for a particular procedure using a different significance level. Appendix D provides the equations necessary to perform such calculations.

Calculation of estimated annual percent change

The overall nature of the observed trends in procedures is summarized using the estimated annual percent change, or EAPC (Miller et al., 1992). The EAPC is derived by fitting a regression line to the natural logarithm of the procedure rates, using calendar year as the independent variable. The EAPC is equal to $100(e^m - 1)$, where m is the slope of the regression line. A negative EAPC indicates that the rate of procedures is declining over time; a positive EAPC indicates that the rate is increasing. The standard error of the slope was used to generate CIEs that were compared, in the same manner as described above, to identify differences between races in trends of change in procedure rates.

Interpreting detailed graphs and tables

For each procedure category, a graph illustrates the point estimates and trends for discharges of black patients and white patients. Note that the scale for the vertical axis of each graph will differ according to the magnitude of the number of procedures performed. Thus, caution must be exercised in making temporal comparisons across procedure categories using the graphs alone.

Below each graph is a table that provides the details required for assessing the significance of apparent differences. The table contains point estimates of the rate of procedures for each year and each racial group. CIEs appear below each point estimate; the confidence intervals allow assessment of differences from year to year within a racial group and between races for a given year. The EAPC provides a summary measure of the rate of change over time within each race. The confidence interval formed about the EAPC can be used to determine whether the annual rate of change is significantly different from zero. In addition, comparing the confidence intervals for the EAPCs allows the reader to evaluate whether the annual rate of change is significantly different between the race groups.

A number of procedure categories had rates of utilization that were extremely low, yielding unstable estimates. Examples include 9—corneal transplant; 13—other retina procedures; 38—heart transplant; 45—other vascular bypass

and shunt, not heart; 49—other open heart procedures; 50—bone marrow transplant; 54—injection or ligation of esophageal varices; 85—kidney transplant; 91—extracorporeal lithotripsy, urinary; and 152—encephalogram. These estimates should be interpreted with caution.

Results

This section summarizes some findings from the detailed graphs and tables. Tables 2 and 3 identify procedure categories for which significant differences in the rates of procedures were found between black patients and white patients. For 36 procedure categories, white patients had significantly higher procedure rates than black patients for at least seven of the eight years of the study (Table 2); the rates for black patients were higher for 10 procedure categories (Table 3). To summarize these differences, a mean adjusted procedure rate was calculated across all eight years.

As shown in Table 2, white patients tended to receive more procedures pertaining to the circulatory system (6 procedures out of 36: categories 35, 37, 39, 40, 41, and 42) and musculoskeletal system (14 procedures: categories 3, 23, 120, 123, 124, 127, 129, 130, 131, 136, 137, 138, 139, and 154). The white population had higher rates for a procedure category that is more likely to be elective (19—plastic procedures on nose) and for one whose widespread use has been questioned (22—tonsillectomy and/or adenoidectomy). Rates among white patients were also higher for some procedures that are required to treat certain acute infectious processes (15—myringotomy, tympanostomy, tympanoplasty; 17—mastoidectomy; and 64—appendectomy).

For those procedure categories performed more frequently among black patients (Table 3), three pertain to the treatment of renal failure (categories 46, 47, and 77) and three are obstetrical (categories 105, 108, and 109). One procedure category (134—amputation of lower extremity) is often performed because of vascular complications arising as a sequela of longstanding diabetes mellitus.

Table 4 summarizes those procedure categories for which significant increases in rates were detected for both races over the 8-year period (i.e., the confidence interval for the EAPC exceeds zero). The table is divided into two sections. The first section lists the 31 procedure categories for which the rates of increase did not differ significantly between the races. Represented are five procedures pertaining to the cardiovascular system (35, 36, 39, 43, 48), four obstetrical procedures (105, 116, 117, 118), two joint replacements (130, 131), and seven diagnostic procedures (153, 160, 161, 162, 163, 165, 166).

The second section of Table 4 lists the eight procedure categories for which rates increased for both races, but the rates differed significantly between the two groups. In each case, the rate of increase for black patients was significantly higher than the rate for white patients. Six of the eight procedure categories represent relatively minor interventions (categories 37, 46, 57, 132, 145, 172).

Table 5 lists 66 procedure categories for which the rates decreased significantly for both races. The majority of these procedure categories are relatively minor, e.g., 5—decompression peripheral nerve, 11—lens (cataract) extraction, 70—inguinal and femoral hernia repair. Thus, many of the decreases may reflect a shift of medical interventions away from hospitals to ambulatory care settings. Several of these declining procedures (e.g., 60—surgical treatment for peptic ulcer and 97—open prostatectomy) are being replaced by other, less invasive interventions. Fourteen procedure categories are diagnostic in nature, including biopsies, endoscopies, and imaging studies (categories 27, 51, 65, 73, 75, 82, 100, 110, 112, 140, 156, 157, 158, 169).

Table 5 is also split into two sections. First, 58 procedures are listed for which the trends for the races were statistically similar. Then eight procedures follow for which the trends, although declining, were significantly different between the groups. For five of the eight procedure categories for which EAPCs differ by race, the rates of decline were higher for black patients than for white patients (categories 71, 74, 89, 141, 158).

Other interesting findings based on the detailed graphs and tables include the following:

- The trends for black patients and white patients were in opposite directions for two procedures. Black rates increased for procedure 78—other upper gastrointestinal procedures, while the white trend fell significantly, so that in the latter years the rates for both races were

essentially the same. On the other hand, the black trend fell and the white trend increased for procedure 138—arthroplasty of other joint.

- Black patients had significantly increasing trends for three procedures (4—spinal tap, injection into spinal canal; 125—treatment, fracture of lower extremity; and 148—suture of skin and subcutaneous tissue) and decreasing trends for two procedures (53—other procedures, hemic and lymphatic system, and 77—peritoneal dialysis), but the trends for white patients were not significantly different from zero.
- For two procedures (147—other excision of skin and subcutaneous tissue and 149—skin graft), the white trends decreased and there was no change in black rates.
- For four procedures (11—lens (cataract) extraction; 24—other procedures on the nasopharynx; 101—other procedures, male genital; and 128—division of joint capsule, cartilage), white rates were higher in the early part of the period and then converged toward the much lower black rates.

Conclusion

This study examined trends in rates of inpatient procedures among discharges of black patients and white patients in the United States to identify differences that warrant further study. Examples of research questions that can be generated using these data include the following:

- Do the nearly 50-percent lower rates for some musculoskeletal procedures for black patients occur because black persons have a lower rate of musculoskeletal disease that warrants the procedure or because they receive less invasive treatment, appropriately or inappropriately?
- Does the notably higher rate of abortion in the hospital among black women represent preferences of women, decisions by their physician, or decisions based on health care financing constraints? Is it related to health status differentials between black women and white women?
- Do the higher rates of dialysis, amputation, and treatment for glaucoma among black patients relate to a higher incidence of the disease generally, or are they attributable to poorer primary care?

The exploratory nature of this report is largely mandated by limitations that must be considered when interpreting these data. Because the HCUP database does not include detailed clinical information beyond diagnoses and procedures, this study cannot evaluate the medical appropriateness of a particular procedure. Low rates of utilization are not necessarily indicative of poorer care because they may, in fact, represent a more desirable target level. Likewise, higher procedure rates may represent overutilization of procedures and may be associated with poorer outcomes.

This study identified a number of significant differences between black patients and white patients in the rates and trends of performance of procedures, confirming some reports that were limited to smaller regions and identifying other variations not previously described. This report is, however, just the beginning. The intent is to provide a compendium of information for continued hypothesis generation and exploration. Although this study controlled for two demographic determinants of utilization (age and sex), many factors that may modify the effect of race in determining the use of services could not be considered here. The remaining variations may be attributed to differences in health status, differential access to health services, variations in the quality of facilities and providers, and other factors that predispose people to varying levels of health services utilization (Griffith et al., 1985). Further exploration of such factors may help explain some of the variations in medical practice patterns and may provide valuable input to policy decisions aimed at reducing differences in treatment patterns among population subgroups.

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Table 1
Percent distribution of discharges from HCUP-2[1] hospitals from 1980 through 1987, by race

Race	1980	1981	1982	1983	1984	1985	1986	1987	Percent change before and after 1985[2]
White	80.1	79.0	78.2	77.7	77.4	78.6	75.2	73.9	–3.9
Black	10.6	10.5	10.5	10.8	10.9	10.1	10.8	11.4	2.3
Hispanic	3.1	3.6	3.5	3.8	4.5	4.4	4.6	4.6	10.8
Asian	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7	27.3
American Indian	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.0
Other	0.9	0.9	1.0	1.0	1.3	0.8	1.4	1.3	17.4
Unknown	4.6	5.3	6.2	6.0	5.0	5.2	7.0	7.8	34.5

[1] HCUP-2 is Hospital Cost and Utilization Project, 1980-87.
[2] Comparison of means for 1983 and 1984 (before coding change) with 1986 and 1987 (after).

Note: Unweighted and unadjusted data.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Data from the Hospital Cost and Utilization Project, 1980-87.

Table 2
Procedure categories with significantly higher rates for white patients than black patients: HCUP-2[1] hospitals, 1980-87

	Procedure category	Black	White
		Mean adjusted rate per 100,000 population	
3.	Laminectomy, excision intervertebral disc	65.8	141.7
5.	Decompression peripheral nerve	19.6	33.7
15.	Myringotomy, tympanostomy, tympanoplasty	25.3	99.4
16.	Other ear procedures	15.2	36.5
17.	Mastoidectomy	3.5	11.0
19.	Plastic procedures on nose	16.7	81.6
22.	Tonsillectomy and/or adenoidectomy	73.6	189.1
23.	Other procedures on nose, fracture repair	15.1	54.5
35.	Coronary artery bypass graft (CABG)	21.7	71.6
37.	Cardiac catheterization, coronary arteriography	227.0	394.6
39.	Insertion of cardiac pacemaker	54.6	80.3
40.	Endarterectomy (any vessel)	16.8	42.1
41.	Aortic resection with replacement	3.4	9.8
42.	Varicose vein stripping	7.8	18.6
62.	Colon resection	62.7	85.2
64.	Appendectomy	63.2	118.3
67.	Cholecystectomy and common duct exploration	123.7	217.4
70.	Inguinal and femoral hernia repair	114.4	187.0
86.	Transurethral removal of urinary obstruction	8.0	26.0
88.	Transurethral biopsy, bladder tissue	31.6	61.2
89.	Genitourinary incontinence procedures	24.3	93.3
120.	Partial excision of bone	50.6	87.3
123.	Treatment, fracture of radius and ulna	26.1	55.3
124.	Treatment, fracture of hip and femur	52.3	101.2
127.	Arthroscopy	42.4	83.1
129.	Excision of semilunar cartilage of knee	24.9	53.6

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 2—Continued
Procedure categories with significantly higher rates for white patients than black patients: HCUP-2[1] hospitals, 1980-87

	Procedure category	Black	White
		Mean adjusted rate per 100,000 population	
130.	Arthroplasty of knee	31.6	54.4
131.	Hip replacement, total and partial	30.5	64.8
136.	Other local excision of lesion of joint	9.9	17.8
137.	Repair and plastic procedures on bone	13.9	22.7
138.	Arthroplasty of other joint	21.4	38.3
139.	Other procedures, musculoskeletal system	101.8	145.1
150.	Other repair of skin and subcutaneous tissue	10.1	21.8
151.	Other procedures on skin and breast	21.3	34.6
154.	Myelogram	97.5	158.7
159.	Cerebral arteriogram	50.9	80.4

[1] HCUP-2 is Hospital Cost and Utilization Project, 1980-87.

Note: Differences are considered significant based on comparison of confidence intervals, as shown in detailed tables; nonoverlapping confidence intervals for procedure rates were present for at least 7 of the 8 years. Rates are adjusted for age and sex differences.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Data from the Hospital Cost and Utilization Project, 1980-87.

Table 3
Procedure categories with significantly higher rates for black patients than white patients: HCUP-2[1] hospitals, 1980-87

	Procedure category	Black	White
		Mean adjusted rate per 100,000 population	
10.	Glaucoma procedures	13.4	5.6
46.	Creation of arteriovenous fistula	33.1	6.9
47.	Hemodialysis	155.7	37.7
77.	Peritoneal dialysis	62.1	17.1
105.	Salpingectomy, removal tubal pregnancy	24.8	10.1
108.	Abortion (termination of pregnancy)	85.8	19.1
109.	Dilatation and curettage (D&C), aspiration after delivery or abortion	124.6	70.8
132.	Arthrocentesis	27.8	13.6
134.	Amputation of lower extremity	88.6	32.1
142.	Incision of skin and subcutaneous tissue	85.7	47.4

[1] HCUP-2 is Hospital Cost and Utilization Project, 1980-87.

Note: Differences are considered significant based on comparison of confidence intervals, as shown in detailed tables; nonoverlapping confidence intervals for procedure rates were present for at least 7 of the 8 years. Rates are adjusted for age and sex differences.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Data from the Hospital Cost and Utilization Project, 1980-87.

Table 4

Procedure categories with significantly increasing rates for both black patients and white patients: HCUP-2[1] hospitals, 1980-87

	Procedure category	Black	White
	Not significantly different by race	EAPC[2]	
3.	Laminectomy, excision intervertebral disc	4.1	4.2
26.	Tracheostomy, temporary and permanent	5.2	2.2
30.	Thoracotomy, chest drainage	7.4	5.3
31.	Thoracentesis	7.1	5.3
35.	Coronary artery bypass graft (CABG)	10.7	9.4
36.	Percutaneous transluminal coronary angioplasty (PTCA)	64.0	69.7
39.	Insertion of cardiac pacemaker	4.3	3.2
43.	Other vascular catheterization, not heart	28.7	27.4
47.	Hemodialysis	15.1	10.0
48.	Other cardiovascular procedures	8.1	6.4
59.	Ileostomy and other enterostomy	6.9	5.0
63.	Small bowel resection	3.5	3.6
68.	Other gallbladder procedures	6.9	6.7
76.	Excision, lysis peritoneal tissue	2.8	2.9
90.	Ureteral catheterization	18.5	21.3
105.	Salpingectomy, removal tubal pregnancy	9.5	5.0
116.	Cesarean section	5.6	4.7
117.	Amniocentesis	4.6	5.3
118.	Fetal monitoring	9.1	6.0
130.	Arthroplasty of knee	6.2	6.8
131.	Hip replacement, total and partial	5.5	4.0
137.	Repair and plastic procedures on bone	6.4	3.1
142.	Incision of skin and subcutaneous tissue	3.6	3.3
153.	Computerized axial tomography (CAT) scan, head	10.8	6.4
160.	Arteriogram and venogram (not heart or head)	9.3	7.4
161.	CAT scan, abdomen	22.8	19.7
162.	Diagnostic ultrasound of heart	13.6	11.0
163.	Diagnostic ultrasound of abdomen	6.8	4.1
165.	Treadmill cardiac stress test	11.9	10.5
166.	Electrographic cardiac monitoring	15.4	12.0
168.	Psychiatric procedures	28.9	16.6
	Significantly different by race		
2.	Extracranial ventricular shunt	14.4	4.0
37.	Cardiac catheterization	16.9	13.9
44.	Peripheral vascular bypass	6.6	3.3
46.	Creation of arteriovenous fistula	14.1	5.8
57.	Gastrostomy, temporary and permanent	19.1	8.1
132.	Arthrocentesis	16.6	4.2
145.	Debridement of wound	10.8	6.3
172.	Other nonoperative treatment	11.6	6.1

[1] HCUP-2 is Hospital Cost and Utilization Project, 1980-87.
[2] EAPC is estimated annual percent change.

Note: Trends are considered significant based on evaluation of confidence intervals for EAPCs, shown in detailed tables. EAPCs were positive and confidence intervals did not include zero.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Hospital Cost and Utilization Project, 1980-87.

Table 5
Procedure categories with significantly decreasing rates for both black patients and white patients: HCUP-2[1] hospitals, 1980-87

	Procedure category	Black	White
	Not significantly different by race	EAPC[2]	
5.	Decompression peripheral nerve	−17.9	−17.4
7.	Thyroidectomy	−4.9	−4.7
10.	Glaucoma procedures	−9.9	−13.8
11.	Lens (cataract) extraction	−18.5	−24.2
14.	Other eye procedures	−11.7	−13.3
15.	Myringotomy, tympanostomy, tympanoplasty	−13.0	−14.2
16.	Other ear procedures	−6.2	−8.1
17.	Mastoidectomy	−7.7	−5.5
19.	Plastic procedures on nose	−6.8	−8.5
22.	Tonsillectomy and/or adenoidectomy	−12.3	−12.3
23.	Other procedures on nose, fracture repair	−7.4	−5.7
24.	Other procedures on the nasopharynx	−2.4	−4.3
25.	Excision lesion of larynx	−18.3	−16.1
27.	Tracheoscopy, laryngoscopy (including biopsy)	−2.7	−6.9
42.	Varicose vein stripping	−14.8	−11.4
51.	Bone marrow biopsy	−1.7	−3.2
52.	Splenectomy	−7.3	−2.1
60.	Surgical treatment for peptic ulcer	−1.7	−3.5
64.	Appendectomy	−5.5	−3.6
65.	Proctoscopy and biopsy	−10.3	−16.8
66.	Hemorrhoid procedures	−9.1	−9.1
70.	Inguinal and femoral hernia repair	−8.6	−9.2
73.	Exploratory laparotomy	−3.6	−3.6
75.	Laparoscopy	−9.2	−9.0
79.	Other anal and rectal procedures	−6.4	−9.0
81.	Other gastrointestinal procedures	−2.4	−3.5
82.	Endoscopy urinary tract	−9.1	−7.0
93.	Procedures on the urethra	−12.5	−13.1
95.	Other procedures on the urinary tract	−6.1	−6.5
97.	Open prostatectomy	−7.4	−4.5
98.	Orchiectomy, orchiopexy	−2.8	−6.2
100.	Diagnostic procedures, male genital	−6.7	−6.0
101.	Other procedures, male genital	−6.3	−8.9
102.	Oophorectomy, unilateral and bilateral	−1.6	−0.6
106.	Other procedures on fallopian tubes	−9.9	−9.9
107.	Hysterectomy, abdominal and vaginal	−1.8	−2.3
108.	Abortion (termination of pregnancy)	−14.2	−17.3
109.	D&C, aspiration after delivery or abortion	−5.5	−8.5
110.	Diagnostic D&C	−19.1	−23.1
112.	Other diagnostic procedures, female organs	−14.4	−16.6
113.	Other procedures, female organs	−5.9	−5.2
114.	Episiotomy	−3.7	−3.4
122.	Bunionectomy	−6.8	−5.7
126.	Incision of bone	−6.4	−5.1
129.	Excision of semilunar cartilage of knee	−18.2	−15.9
133.	Procedures on muscles and tendons	−3.5	−5.6
135.	Other fracture and dislocation procedures	−4.4	−4.3
139.	Other procedures, musculoskeletal system	−4.3	−3.2
140.	Breast biopsy	−10.6	−9.8

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 5—Continued
Procedure categories with significantly decreasing rates for both black patients and white patients: HCUP-2[1] hospitals, 1980-87

	Procedure category	Black	White
	Not significantly different by race—con.	EAPC[2]	
144.	Excision of pilonidal cyst	−11.3	−14.0
146.	Excision of skin lesion	−14.0	−12.7
150.	Other repair of skin and subcutaneous tissue	−4.7	−5.0
156.	Upper gastrointestinal x ray	−14.8	−14.3
157.	Lower gastrointestinal x ray	−16.2	−16.2
167.	Special treatments and rehabilitation	−4.9	−5.6
169.	Other x-ray and diagnostic procedures	−10.7	−9.4
170.	Other removal of foreign body	−7.0	−2.7
171.	Miscellaneous procedures	−8.4	−7.0
	Significantly different by race		
20.	Tooth procedures	−9.6	−21.1
71.	Other hernia repair	−7.9	−3.6
74.	Other laparotomy	−7.4	−3.3
89.	Genitourinary incontinence procedures	−6.9	−2.3
104.	Ligation of fallopian tubes	−4.7	−9.3
111.	Other excision of cervix and uterus	−8.9	−15.3
141.	Mastectomy, quadrantectomy, lumpectomy	−9.3	−6.1
158.	Intravenous pyelogram	−22.3	−17.4

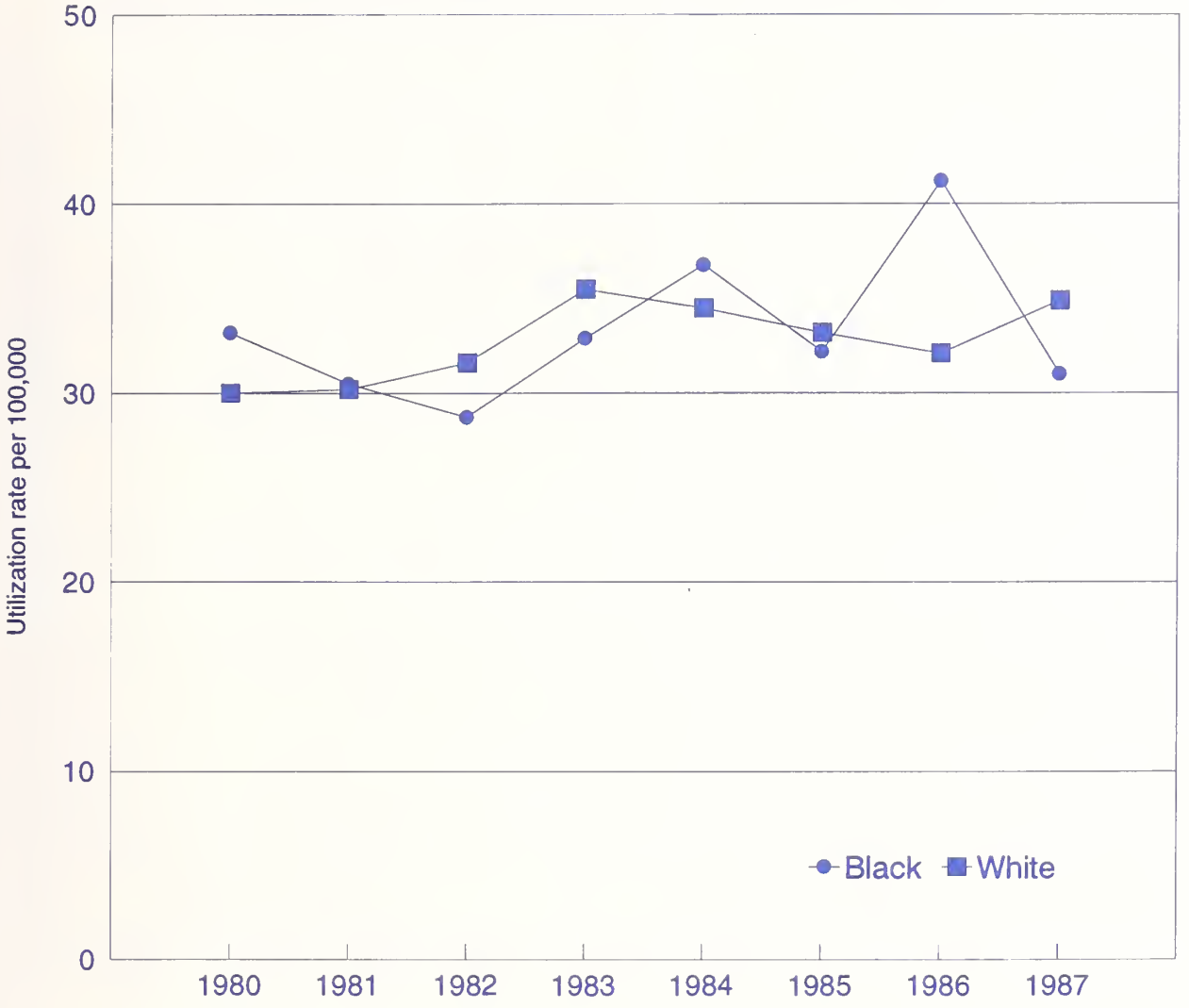
[1] HCUP-2 is Hospital Cost and Utilization Project, 1980-87.
[2] EAPC is estimated annual percent change.

Note: Trends are considered significant based on evaluation of confidence intervals for EAPCs, shown in detailed tables. EAPCs were negative and confidence intervals did not include zero.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Hospital Cost and Utilization Project, 1980-87.

Detailed graphs and tables by procedure category

1. Incision and excision of central nervous system



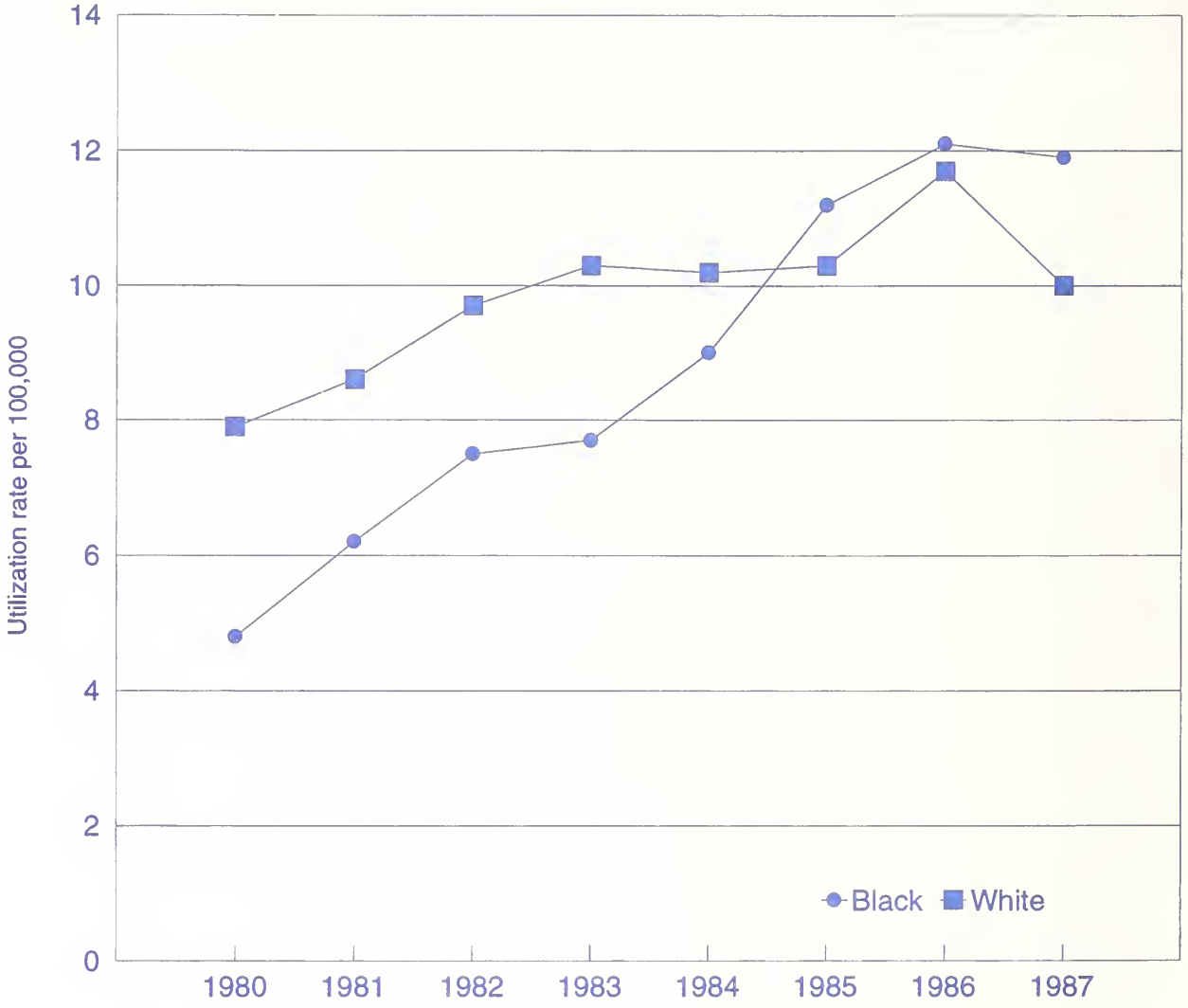
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	33.2 (21.2, 45.3)	30.5 (22.3, 38.8)	28.7 (21.6, 35.8)	32.9 (24.6, 41.1)	36.8 (26.4, 47.3)	32.2 (23.8, 40.6)	41.2 (25.0, 57.5)	31.0 (20.5, 41.6)	1.8 (−1.7, 5.4)
White	30.0 (25.0, 35.0)	30.2 (25.8, 34.6)	31.6 (27.1, 36.1)	35.5 (29.8, 41.2)	34.5 (28.7, 40.3)	33.2 (27.1, 39.3)	32.1 (27.5, 36.7)	34.9 (29.2, 40.7)	1.8 (0.2, 3.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

2. Extracranial ventricular shunt



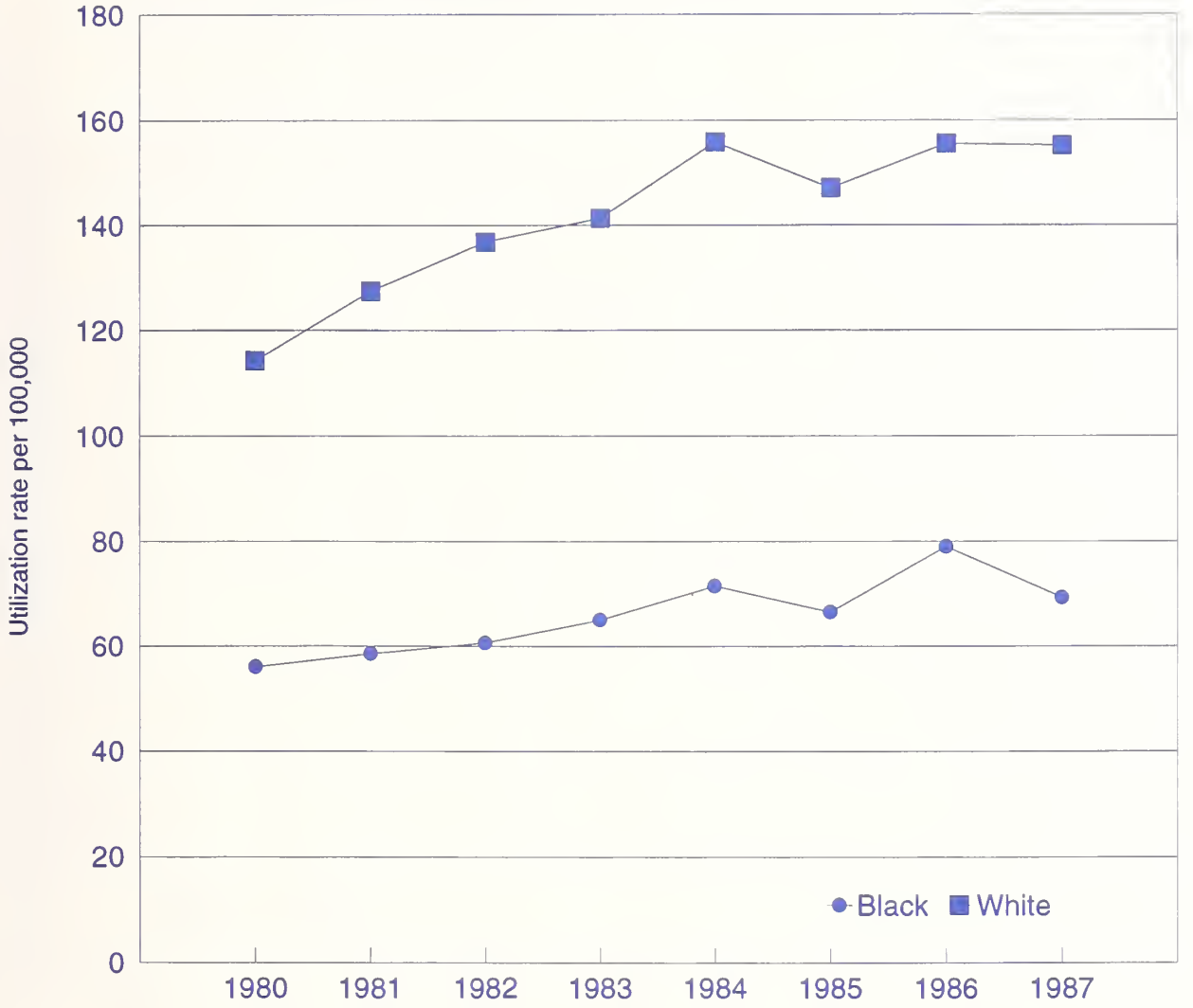
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	4.8 (2.5, 7.1)	6.2 (3.2, 9.2)	7.5 (4.3, 10.6)	7.7 (4.5, 10.9)	9.0 (5.8, 12.2)	11.2 (7.5, 14.9)	12.1 (6.9, 17.3)	11.9 (7.5, 16.3)	14.1 (11.3, 16.9)
White	7.9 (5.9, 9.9)	8.6 (6.9, 10.3)	9.7 (7.7, 11.8)	10.3 (8.2, 12.5)	10.2 (7.5, 12.9)	10.3 (8.2, 12.4)	11.7 (9.3, 14.2)	10.0 (7.7, 12.2)	4.0 (1.6, 6.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

3. Laminectomy, excision intervertebral disc



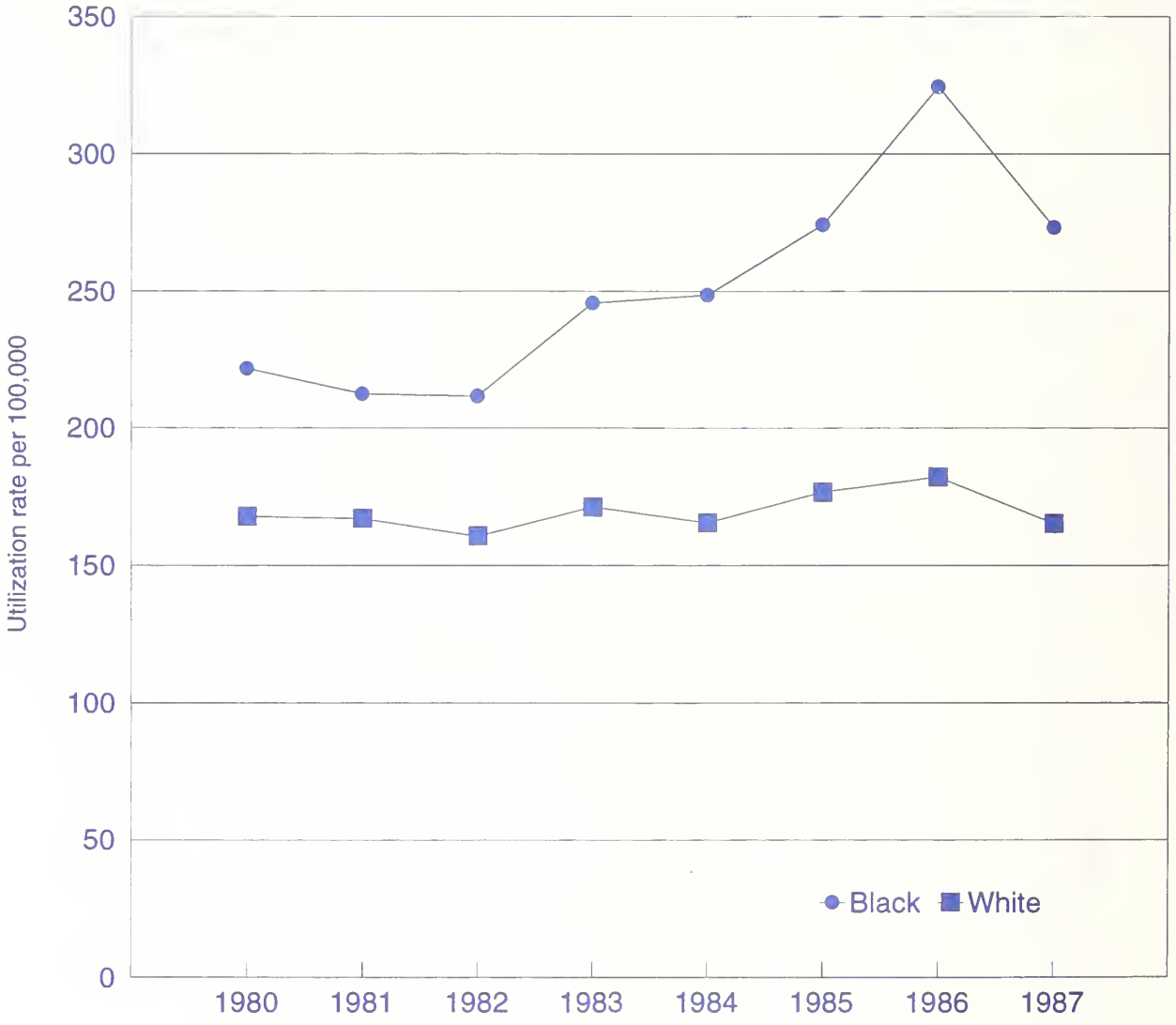
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	56.0 (43.8, 68.3)	58.5 (47.2, 69.8)	60.6 (49.1, 72.1)	65.0 (52.9, 77.2)	71.5 (58.6, 84.4)	66.5 (52.8, 80.2)	79.0 (60.2, 97.7)	69.3 (52.1, 86.5)	4.1 (2.2, 6.0)
White	114.2 (99.2, 129.3)	127.4 (111.9, 142.9)	136.8 (119.7, 153.9)	141.3 (125.5, 157.1)	155.9 (137.2, 174.7)	147.1 (130.1, 164.1)	155.6 (136.2, 174.9)	155.2 (136.6, 173.9)	4.2 (2.6, 5.8)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

4. Spinal tap, injection into spinal canal



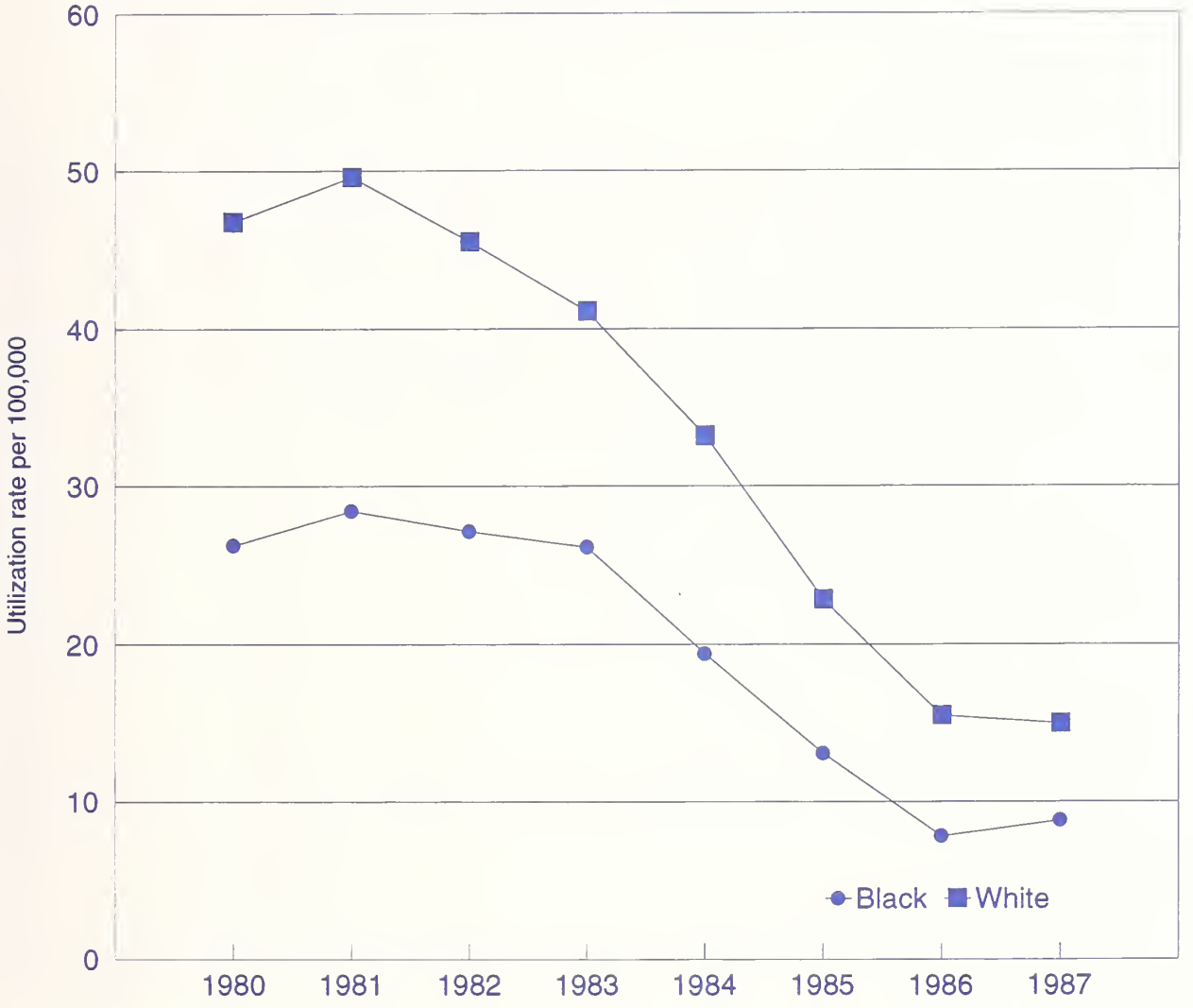
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	221.6 (170.4, 272.7)	212.4 (171.3, 253.4)	211.6 (159.2, 264.0)	245.6 (184.8, 306.4)	248.6 (181.8, 315.5)	274.3 (205.7, 343.0)	324.4 (216.3, 432.4)	273.2 (186.5, 359.9)	5.3 (2.8, 8.0)
White	167.7 (146.3, 189.0)	166.9 (147.1, 186.6)	160.5 (141.1, 180.0)	171.2 (151.4, 191.1)	165.4 (146.6, 184.2)	176.6 (156.5, 196.6)	182.1 (156.9, 207.2)	165.1 (147.8, 182.3)	0.7 (–0.5, 1.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

5. Decompression peripheral nerve



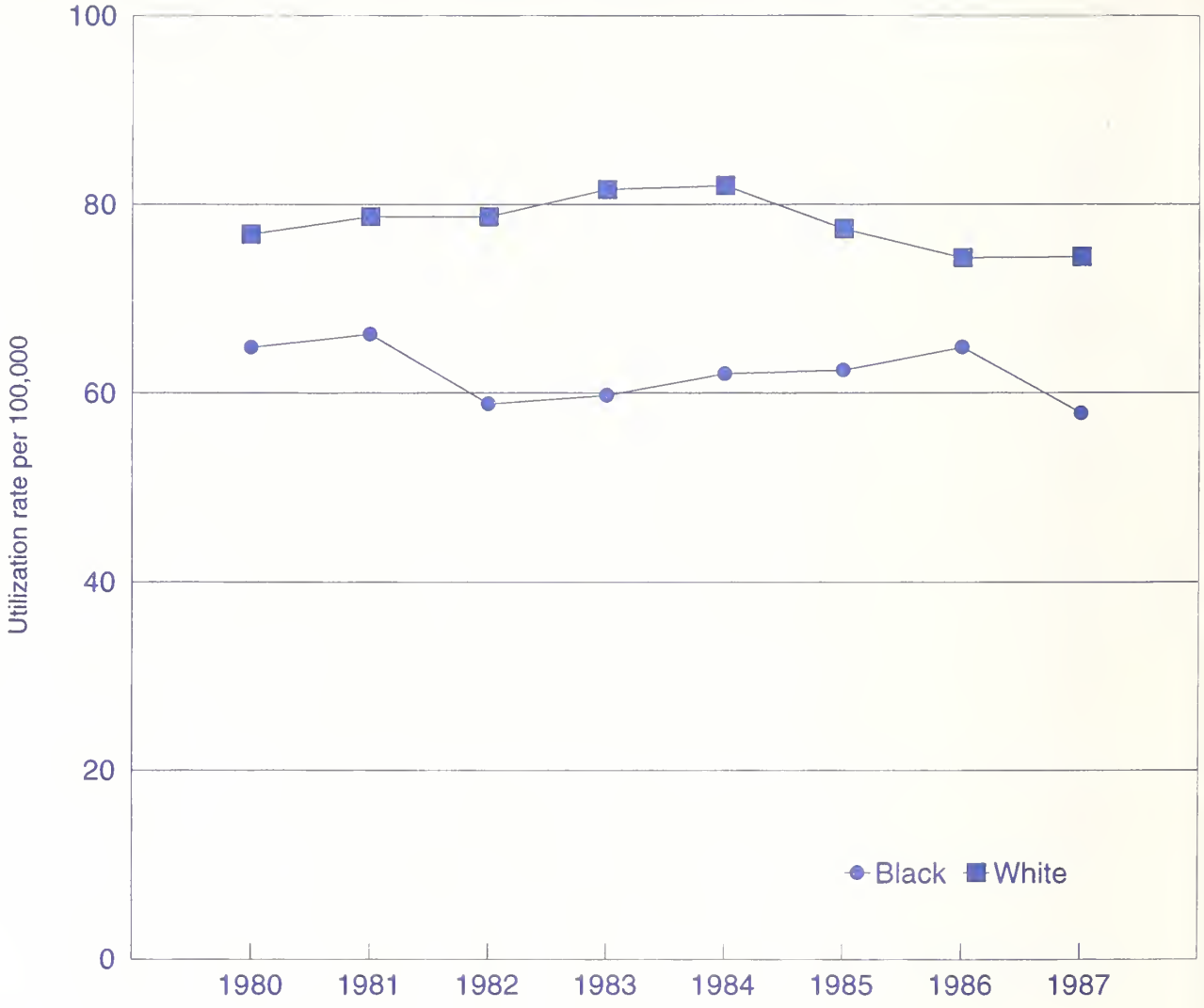
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	26.2 (20.6, 31.8)	28.4 (22.4, 34.4)	27.1 (20.9, 33.2)	26.1 (19.6, 32.5)	19.4 (15.0, 23.8)	13.1 (9.5, 16.6)	7.8 (4.6, 10.9)	8.8 (5.7, 11.9)	−17.9 (−23.6, −11.9)
White	46.8 (42.1, 51.5)	49.6 (44.3, 55.0)	45.5 (40.5, 50.4)	41.1 (36.0, 46.2)	33.2 (29.3, 37.1)	22.8 (19.5, 26.0)	15.5 (12.9, 18.2)	15.0 (11.3, 18.8)	−17.4 (−21.7, −12.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

6. Other nervous system procedures



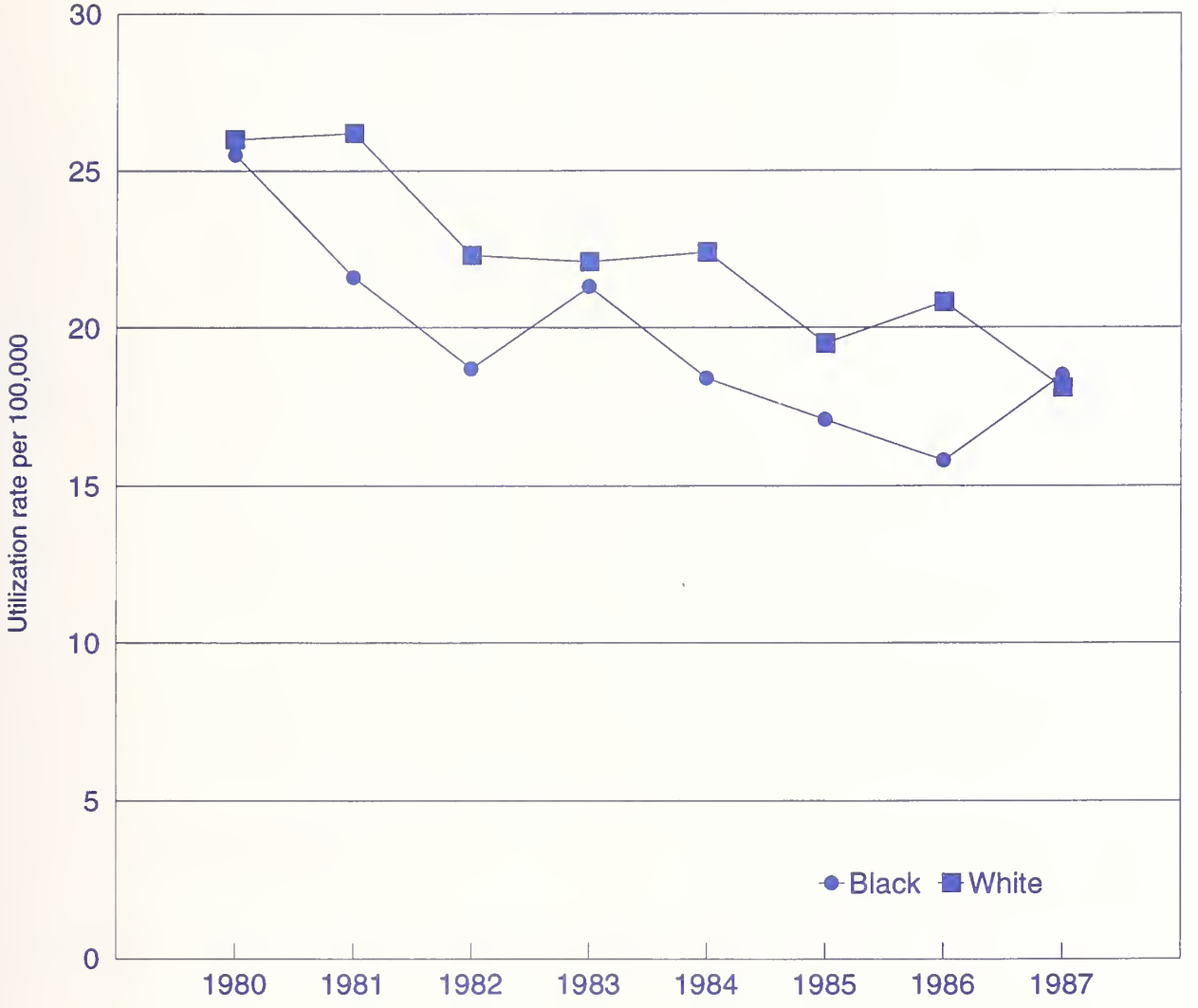
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	64.8 (47.1, 82.4)	66.2 (48.9, 83.4)	58.8 (45.3, 72.4)	59.7 (47.2, 72.1)	62.0 (48.2, 75.8)	62.4 (48.4, 76.4)	64.8 (50.2, 79.4)	57.8 (40.8, 74.9)	–0.8 (–2.3, 0.7)
White	76.8 (68.4, 85.1)	78.7 (71.2, 86.1)	78.7 (70.4, 87.0)	81.6 (73.1, 90.1)	82.0 (73.1, 91.0)	77.4 (67.4, 87.3)	74.3 (64.5, 84.1)	74.4 (63.8, 85.1)	–0.7 (–1.7, 0.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

7. Thyroidectomy



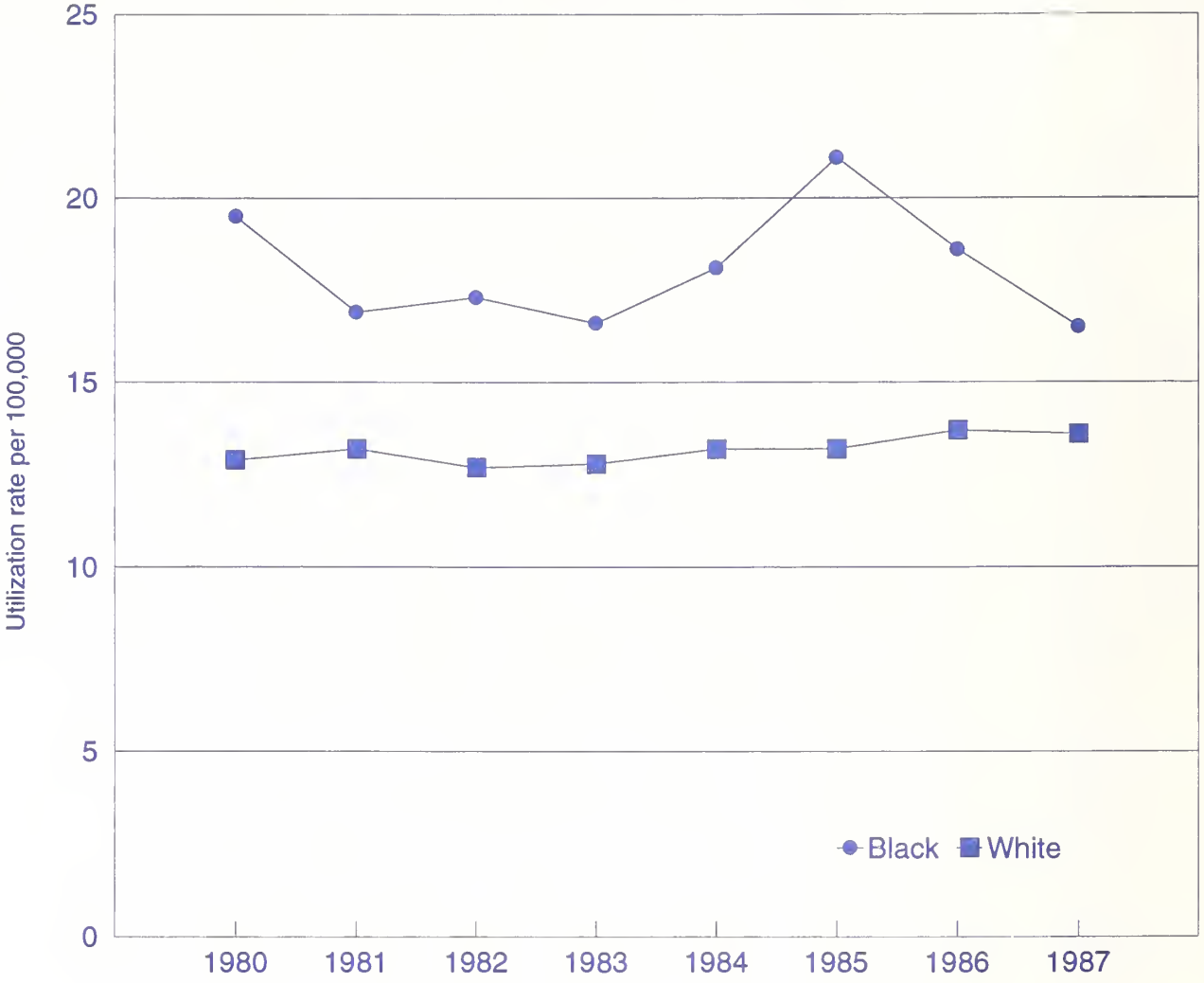
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	25.5 (19.1, 31.9)	21.6 (17.0, 26.3)	18.7 (14.0, 23.4)	21.3 (16.6, 26.0)	18.4 (13.8, 22.9)	17.1 (12.1, 22.0)	15.8 (11.5, 20.2)	18.5 (13.5, 23.4)	–4.9 (–7.6, –2.2)
White	26.0 (23.4, 28.5)	26.2 (23.8, 28.7)	22.3 (20.0, 24.6)	22.1 (19.8, 24.4)	22.4 (20.0, 24.7)	19.5 (17.3, 21.7)	20.8 (18.4, 23.1)	18.1 (16.2, 20.1)	–4.7 (–6.2, –3.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

8. Other endocrine procedures



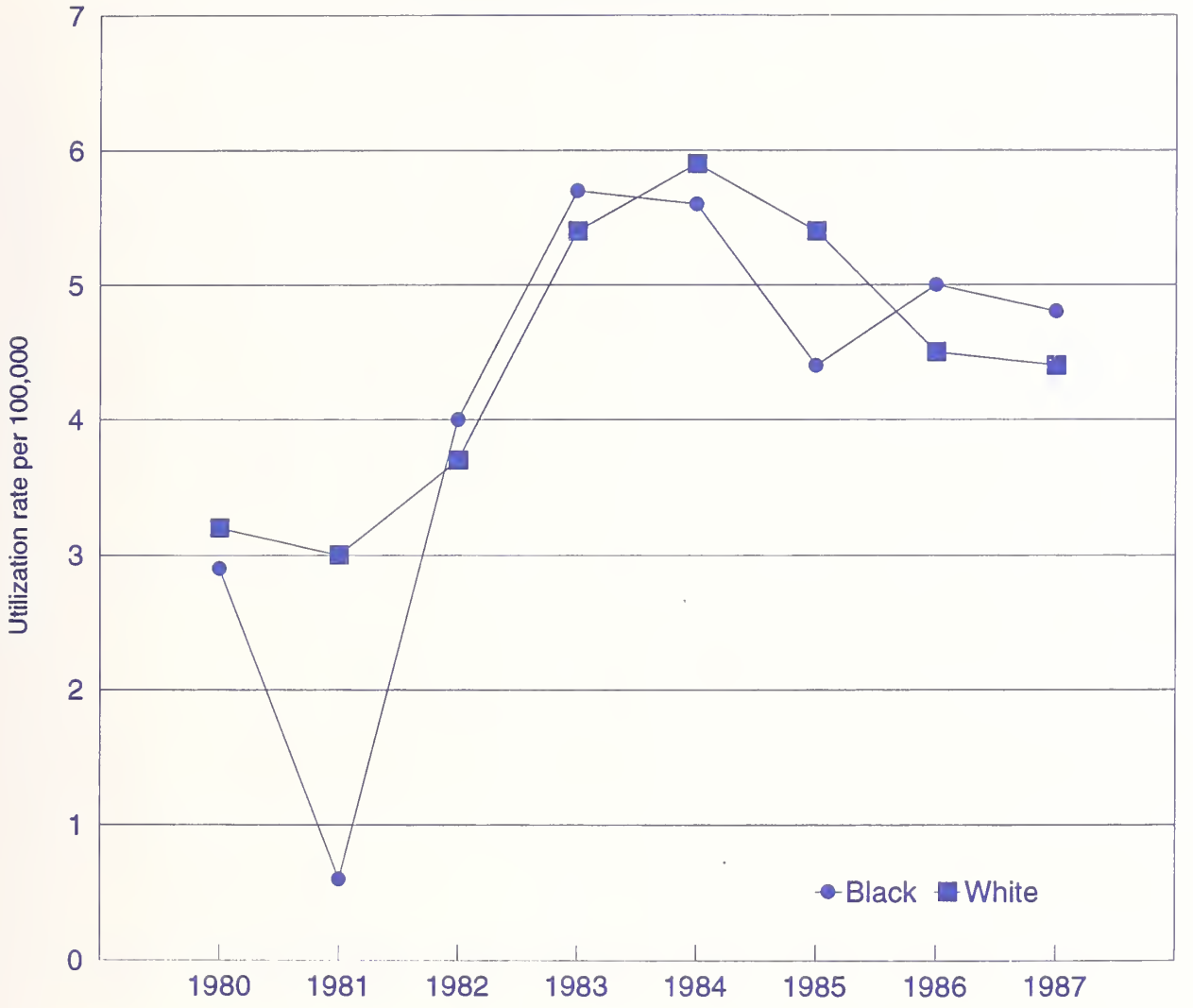
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	19.5 (13.7, 25.3)	16.9 (11.9, 21.9)	17.3 (12.2, 22.4)	16.6 (12.6, 20.6)	18.1 (13.0, 23.2)	21.1 (13.6, 28.5)	18.6 (12.4, 24.8)	16.5 (11.3, 21.8)	0.0 (–2.7, 2.8)
White	12.9 (10.6, 15.3)	13.2 (11.1, 15.3)	12.7 (10.1, 15.3)	12.8 (10.8, 14.8)	13.2 (11.2, 15.2)	13.2 (11.1, 15.3)	13.7 (11.6, 15.7)	13.6 (11.7, 15.4)	0.8 (0.2, 1.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

9. Corneal transplant



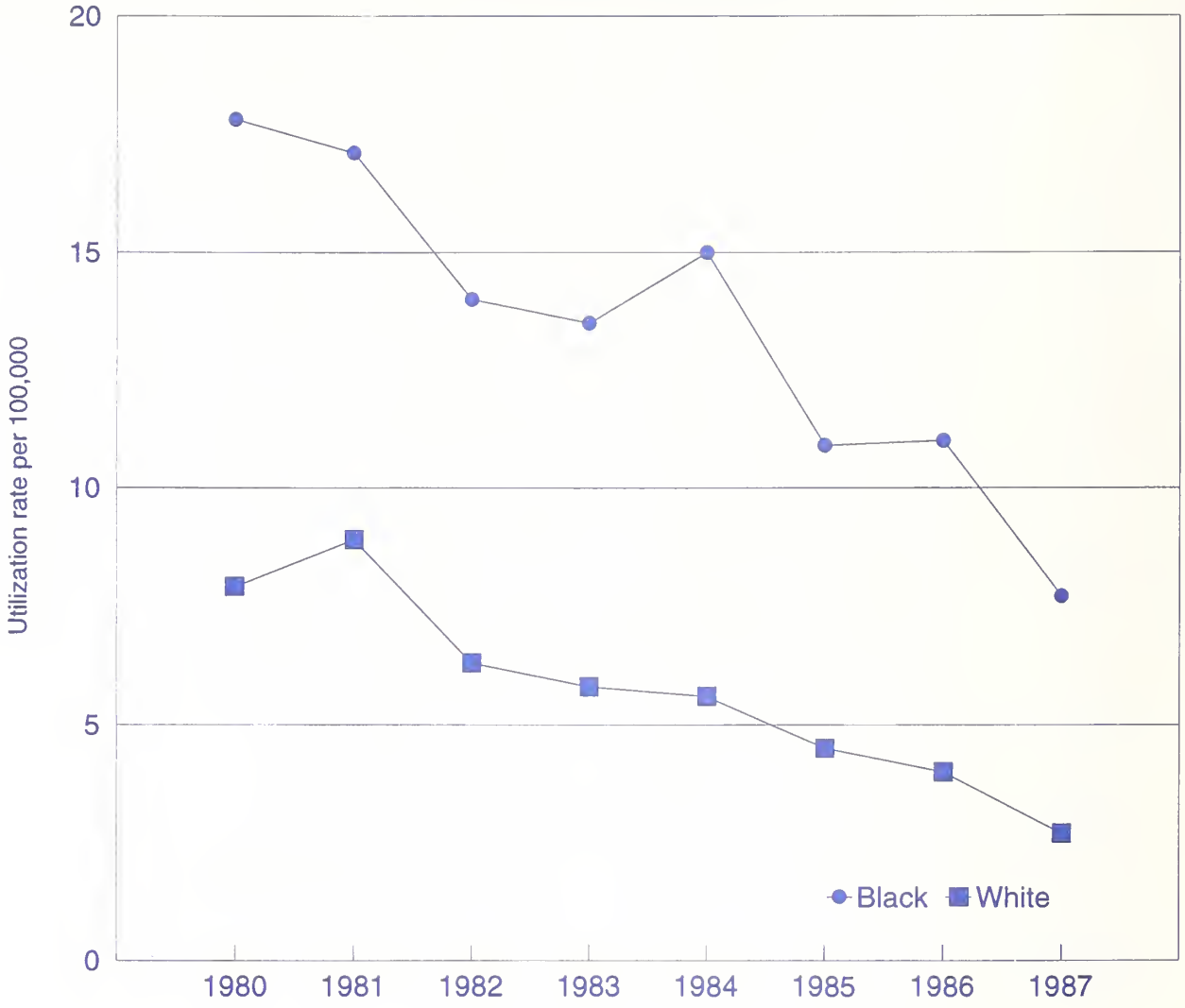
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	2.9 (1.3, 4.4)	0.6 (0.0, 1.3)	4.0 (2.2, 5.8)	5.7 (3.0, 8.3)	5.6 (2.9, 8.2)	4.4 (1.8, 7.0)	5.0 (1.7, 8.2)	4.8 (2.1, 7.4)	18.4 (–2.9, 44.4)
White	3.2 (1.6, 4.8)	3.0 (1.8, 4.1)	3.7 (2.7, 4.7)	5.4 (3.8, 7.0)	5.9 (4.2, 7.5)	5.4 (3.7, 7.2)	4.5 (3.3, 5.6)	4.4 (2.9, 5.9)	6.6 (–0.1, 13.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

10. Glaucoma procedures



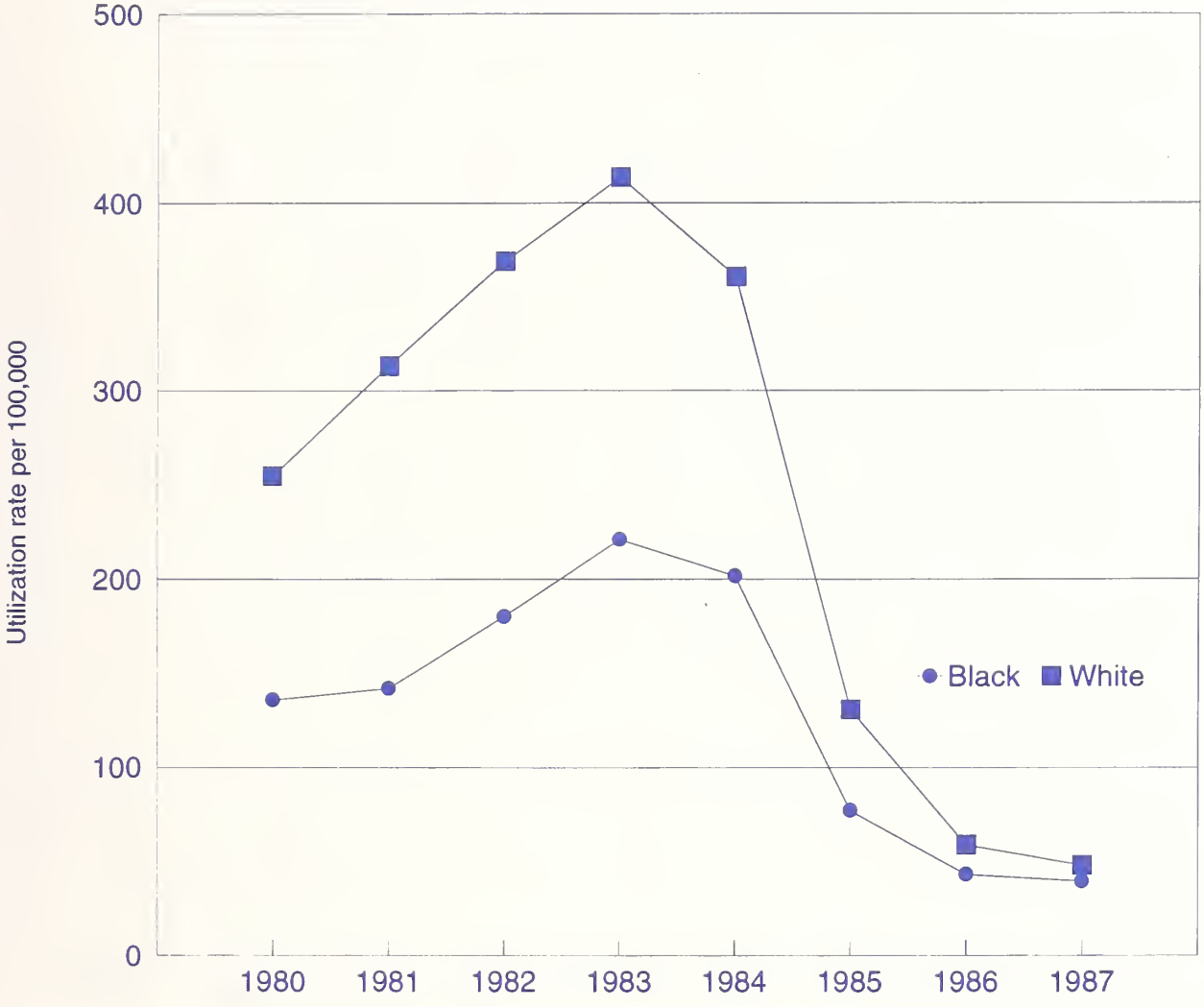
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	17.8 (11.7, 23.8)	17.1 (12.0, 22.3)	14.0 (8.8, 19.3)	13.5 (7.4, 19.5)	15.0 (8.6, 21.3)	10.9 (6.7, 15.1)	11.0 (6.8, 15.2)	7.7 (3.9, 11.4)	−9.9 (−13.0, −6.6)
White	7.9 (6.1, 9.6)	8.9 (7.3, 10.5)	6.3 (5.1, 7.4)	5.8 (4.4, 7.2)	5.6 (4.3, 6.9)	4.5 (3.3, 5.7)	4.0 (3.0, 5.0)	2.7 (1.9, 3.5)	−13.8 (−16.9, −10.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

11. Lens (cataract) extraction



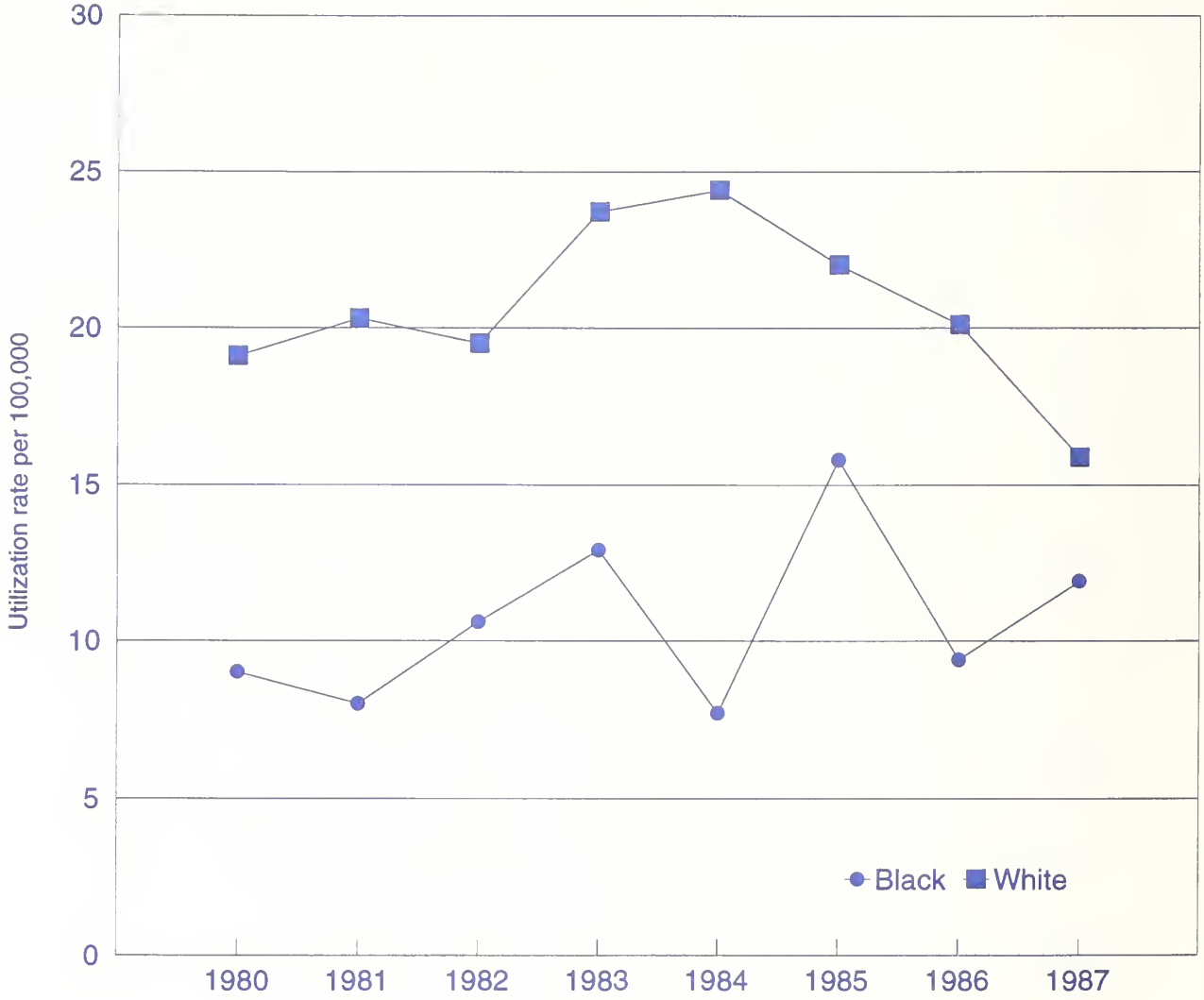
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	135.9 (102.8, 169.1)	141.9 (102.0, 181.8)	180.1 (133.4, 226.7)	220.9 (164.7, 277.0)	201.7 (149.1, 254.3)	77.0 (54.9, 99.1)	43.2 (28.3, 58.2)	39.6 (25.4, 53.7)	−18.5 (−29.9, −5.3)
White	254.8 (217.9, 291.8)	313.1 (273.6, 352.7)	368.9 (323.2, 414.6)	413.7 (364.7, 462.8)	360.7 (310.5, 410.9)	130.8 (105.8, 155.7)	58.9 (45.2, 72.5)	48.0 (29.7, 66.4)	−24.2 (−36.3, −9.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

12. Repair of retinal tear, detachment



Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	9.0 (4.9, 13.0)	8.0 (4.4, 11.6)	10.6 (5.2, 16.0)	12.9 (6.6, 19.2)	7.7 (4.1, 11.3)	15.8 (8.4, 23.2)	9.4 (4.2, 14.6)	11.9 (6.2, 17.5)	4.2 (−3.3, 12.2)
White	19.1 (12.2, 26.1)	20.3 (13.0, 27.5)	19.5 (12.7, 26.3)	23.7 (15.6, 31.9)	24.4 (17.2, 31.6)	22.0 (14.5, 29.6)	20.1 (13.2, 27.0)	15.9 (11.0, 20.8)	−1.1 (−5.3, 3.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

13. Other retina procedures

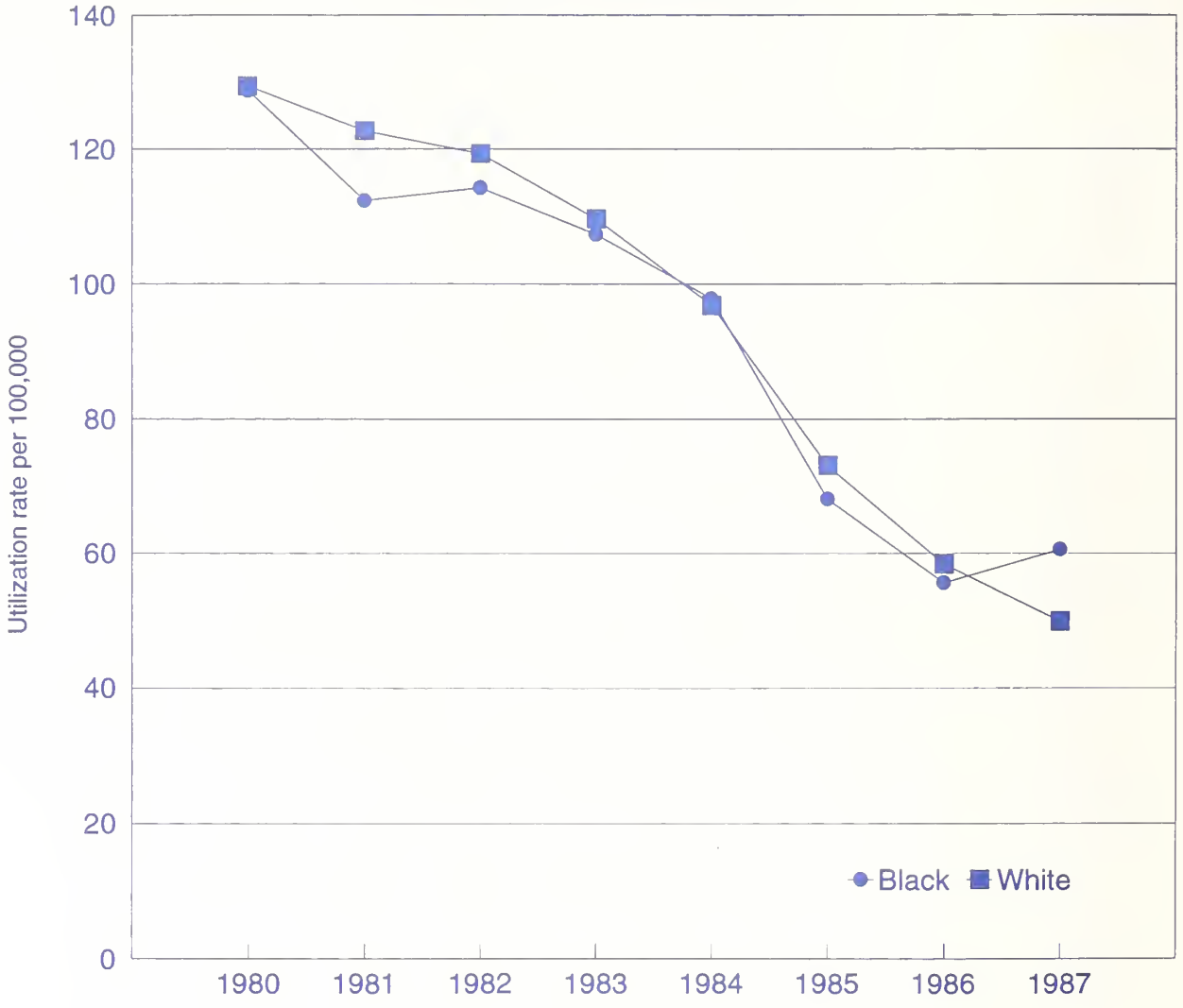
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	1.5 (0.5, 2.5)	0.5 (0.0, 0.9)	1.7 (0.1, 3.2)	0.9 (0.0, 1.8)	2.4 (0.4, 4.5)	1.6 (0.7, 2.5)	0.8 (0.0, 1.6)	1.5 (0.4, 2.6)	4.6 (−11.2, 23.2)
White	1.3 (0.4, 2.2)	1.0 (0.3, 1.8)	1.1 (0.5, 1.7)	1.0 (0.5, 1.6)	2.1 (1.0, 3.1)	1.2 (0.6, 1.8)	1.4 (0.7, 2.1)	1.1 (0.6, 1.6)	1.4 (−5.9, 9.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

14. Other eye procedures



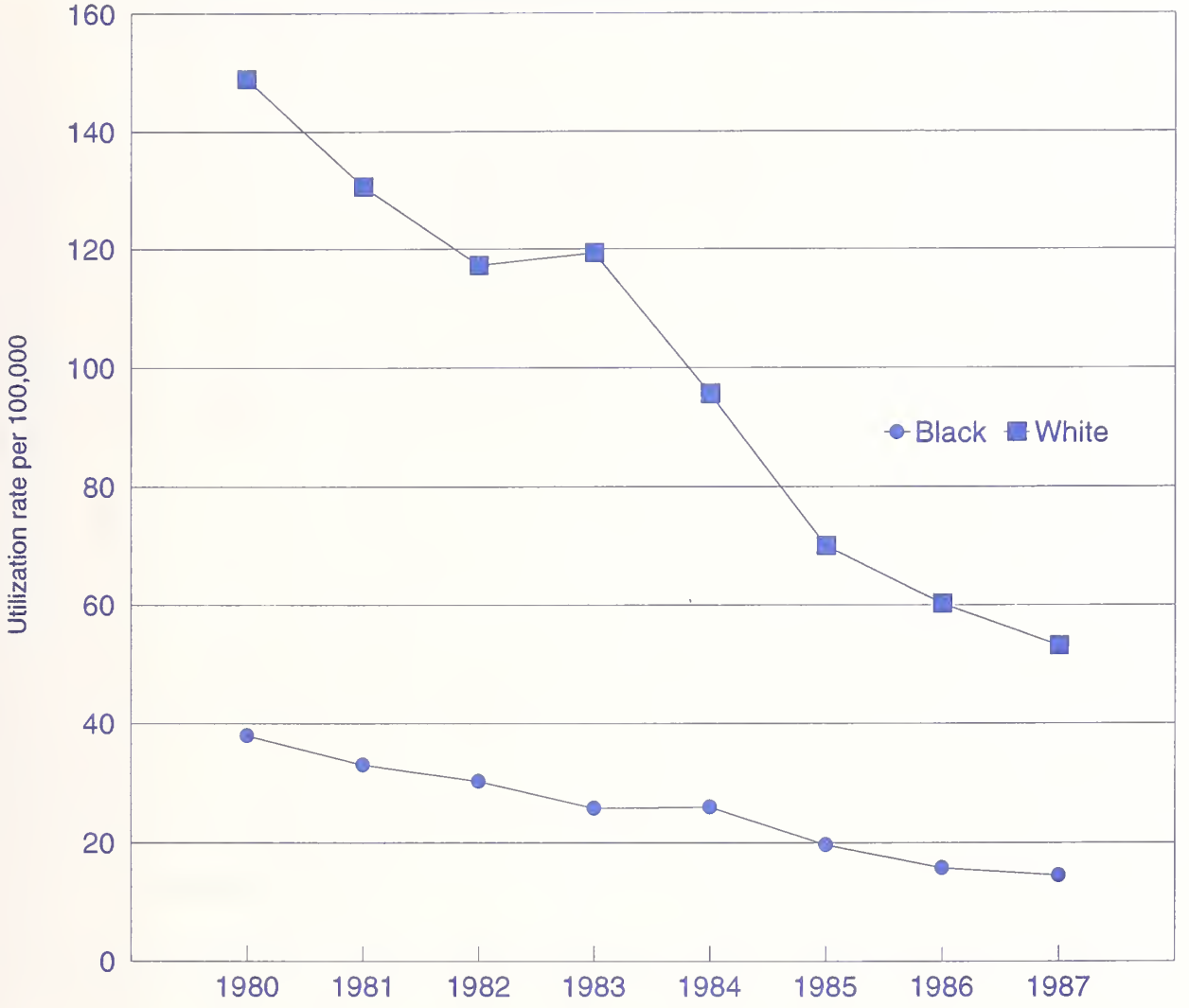
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	128.7 (63.1, 194.2)	112.3 (55.7, 168.9)	114.2 (61.2, 167.3)	107.3 (64.7, 150.0)	97.8 (66.9, 128.7)	68.1 (45.7, 90.6)	55.6 (41.1, 70.1)	60.6 (35.1, 86.1)	−11.7 (−14.9, −8.4)
White	129.4 (110.2, 148.6)	122.7 (105.5, 139.9)	119.3 (100.0, 138.6)	109.6 (94.7, 124.6)	96.8 (82.0, 111.6)	73.1 (61.7, 84.5)	58.4 (49.3, 67.5)	49.9 (41.8, 58.1)	−13.3 (−16.2, −10.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

15. Myringotomy, tympanostomy, tympanoplasty



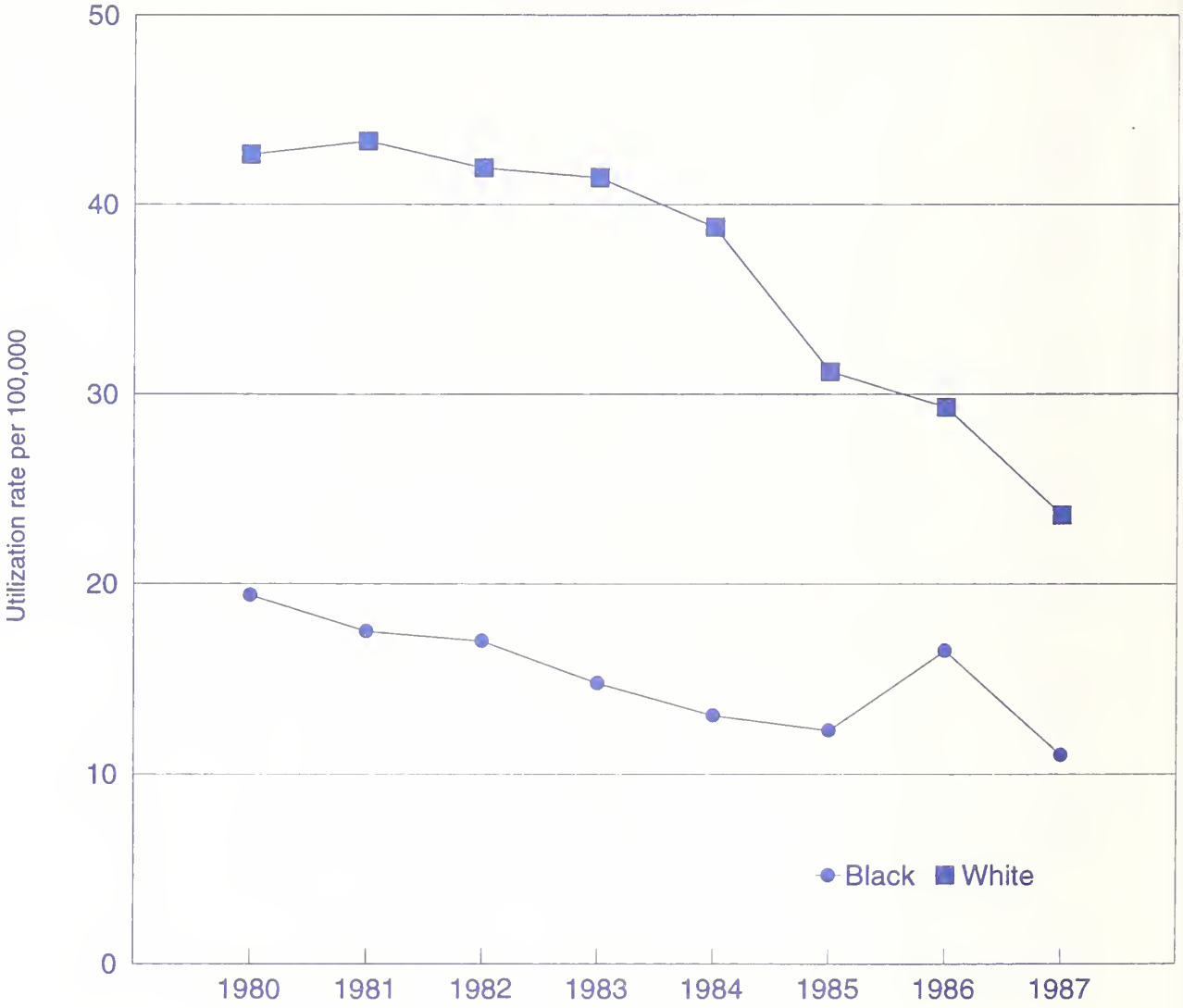
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	37.9	33.0	30.2	25.7	25.9	19.6	15.7	14.5	−13.0
	(24.3,	(23.5,	(21.7,	(18.0,	(16.4,	(14.7,	(10.8,	(8.9,	(−14.8,
	51.5)	42.6)	38.6)	33.3)	35.4)	24.5)	20.6)	20.2)	−11.2)
White	148.9	130.6	117.2	119.3	95.6	70.0	60.2	53.1	−14.2
	(124.3,	(109.0,	(97.0,	(95.5,	(73.3,	(53.3,	(41.6,	(33.5,	(−16.6,
	173.5)	152.3)	137.5)	143.1)	117.9)	86.8)	78.7)	72.8)	−11.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

16. Other ear procedures



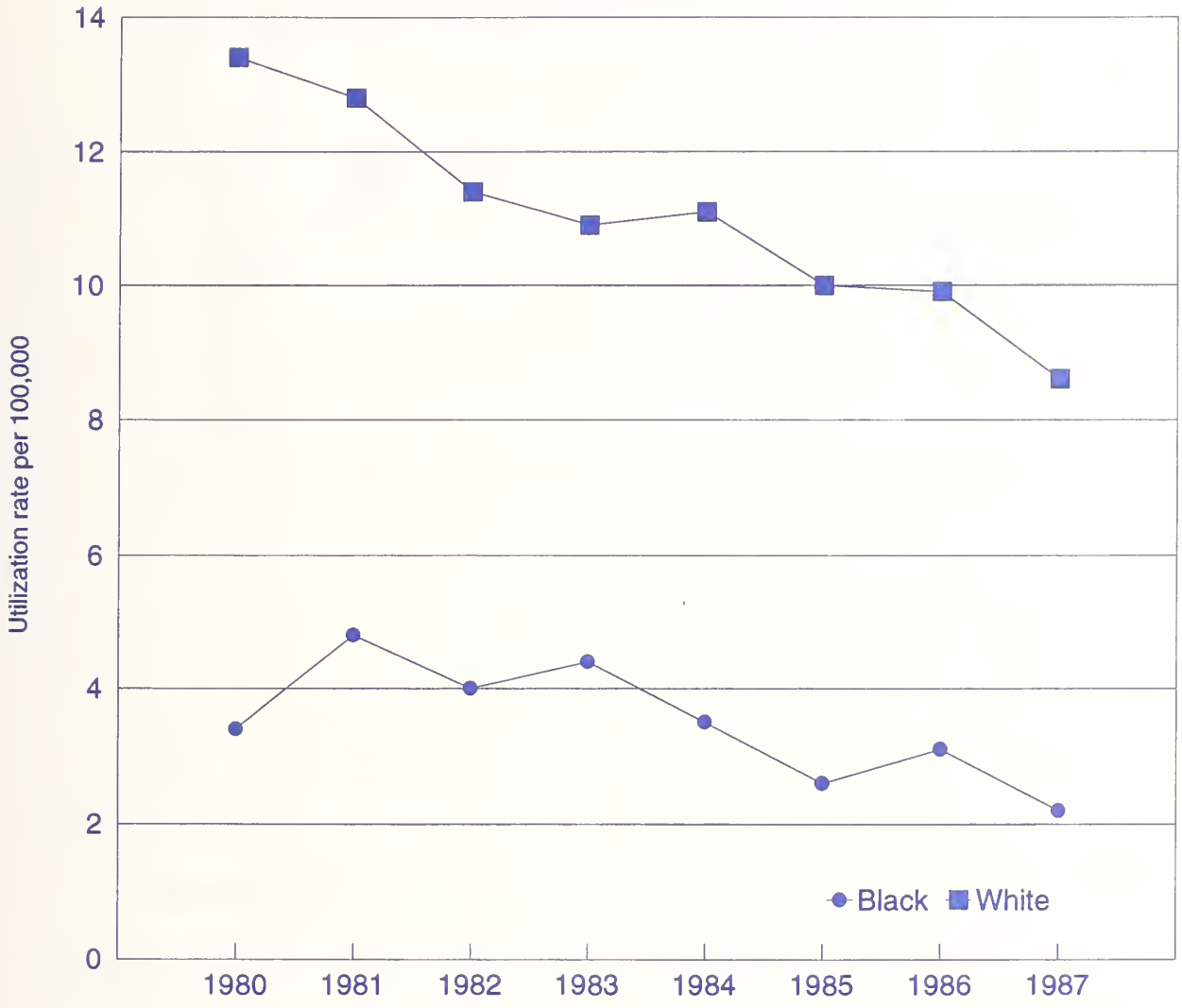
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	19.4 (13.2, 25.6)	17.5 (13.1, 22.0)	17.0 (12.3, 21.8)	14.8 (10.6, 19.1)	13.1 (8.5, 17.8)	12.3 (9.0, 15.7)	16.5 (12.1, 21.0)	11.0 (7.9, 14.1)	–6.2 (–9.7, –2.5)
White	42.6 (35.8, 49.4)	43.3 (35.7, 50.9)	41.9 (34.6, 49.3)	41.4 (34.4, 48.3)	38.8 (32.3, 45.4)	31.2 (26.2, 36.3)	29.3 (24.7, 33.8)	23.6 (19.5, 27.6)	–8.1 (–10.7, –5.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

17. Mastoidectomy



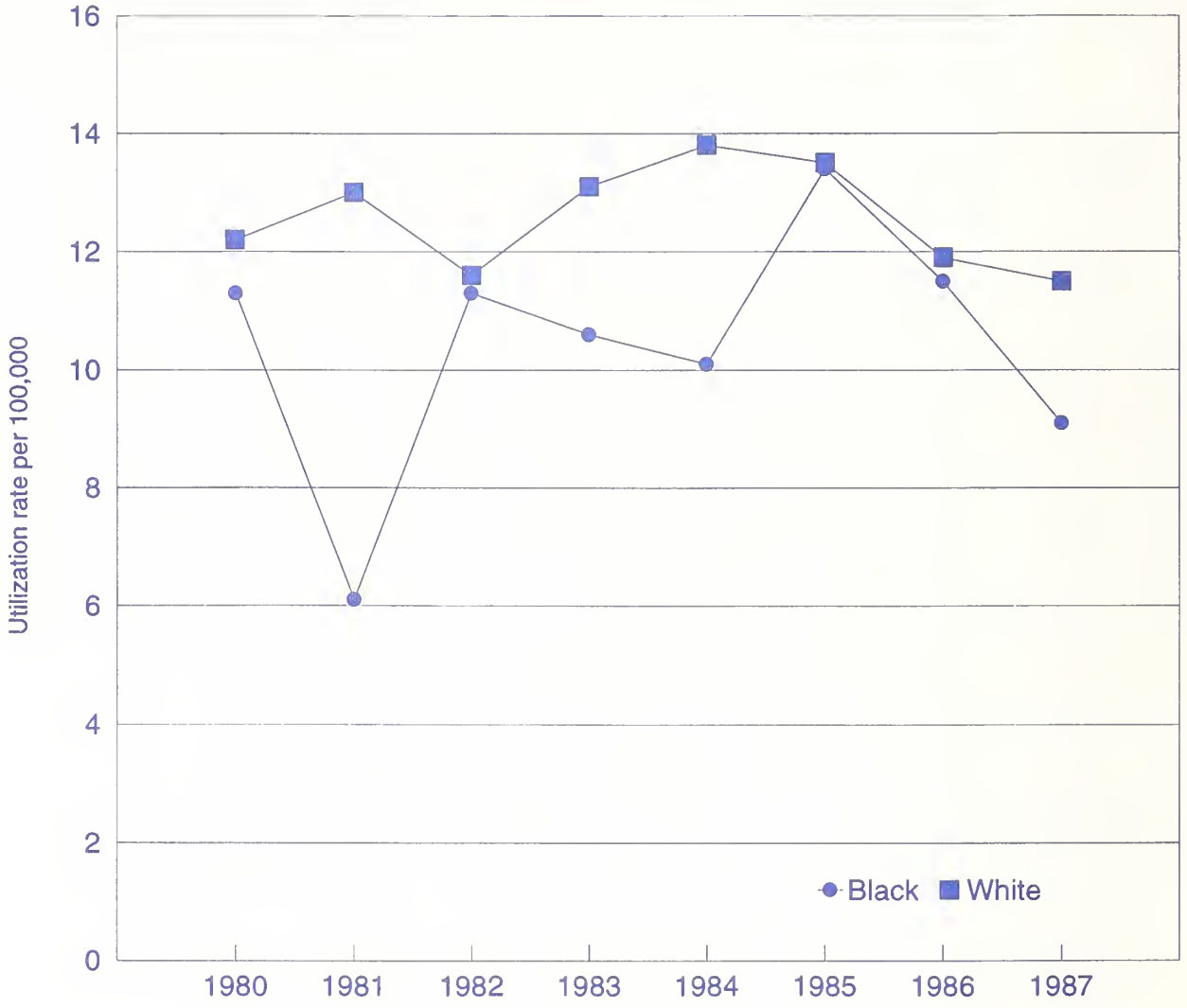
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	3.4 (1.6, 5.3)	4.8 (2.3, 7.2)	4.0 (1.9, 6.2)	4.4 (2.7, 6.1)	3.5 (1.6, 5.4)	2.6 (1.1, 4.1)	3.1 (1.8, 4.4)	2.2 (0.9, 3.5)	–7.7 (–12.6, –2.5)
White	13.4 (10.6, 16.1)	12.8 (10.8, 14.8)	11.4 (9.5, 13.2)	10.9 (9.1, 12.7)	11.1 (9.2, 13.0)	10.0 (8.4, 11.6)	9.9 (8.0, 11.7)	8.6 (7.0, 10.2)	–5.5 (–6.5, –4.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

18. Control of epistaxis



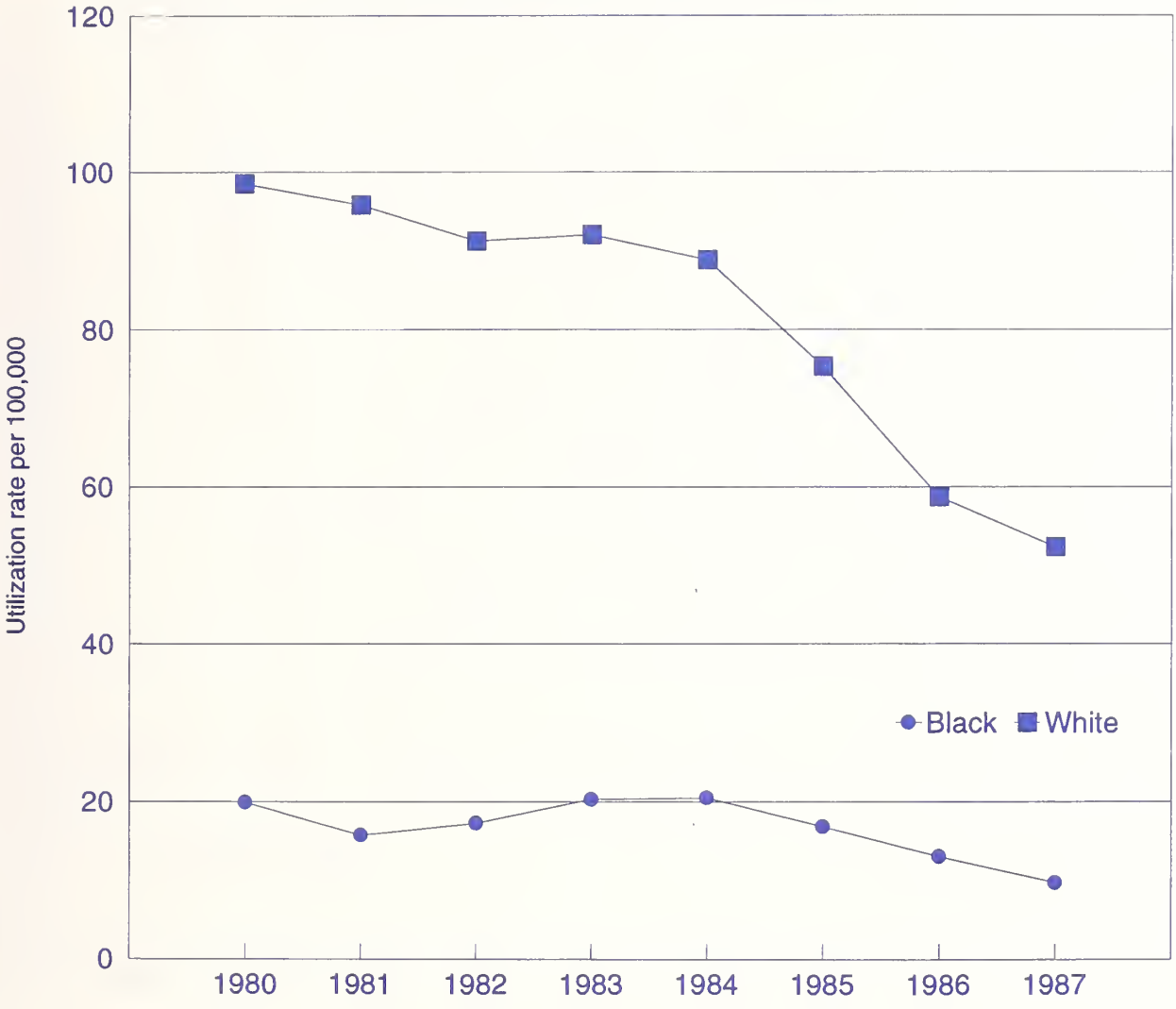
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	11.3 (7.3, 15.3)	6.1 (3.5, 8.7)	11.3 (7.7, 14.8)	10.6 (6.4, 14.7)	10.1 (5.5, 14.6)	13.4 (8.4, 18.4)	11.5 (7.3, 15.7)	9.1 (5.5, 12.6)	2.5 (–4.8, 10.3)
White	12.2 (10.5, 14.0)	13.0 (11.1, 15.0)	11.6 (10.0, 13.3)	13.1 (10.2, 16.1)	13.8 (11.7, 16.0)	13.5 (11.7, 15.3)	11.9 (10.1, 13.6)	11.5 (9.6, 13.5)	–0.4 (–2.7, 1.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

19. Plastic procedures on nose



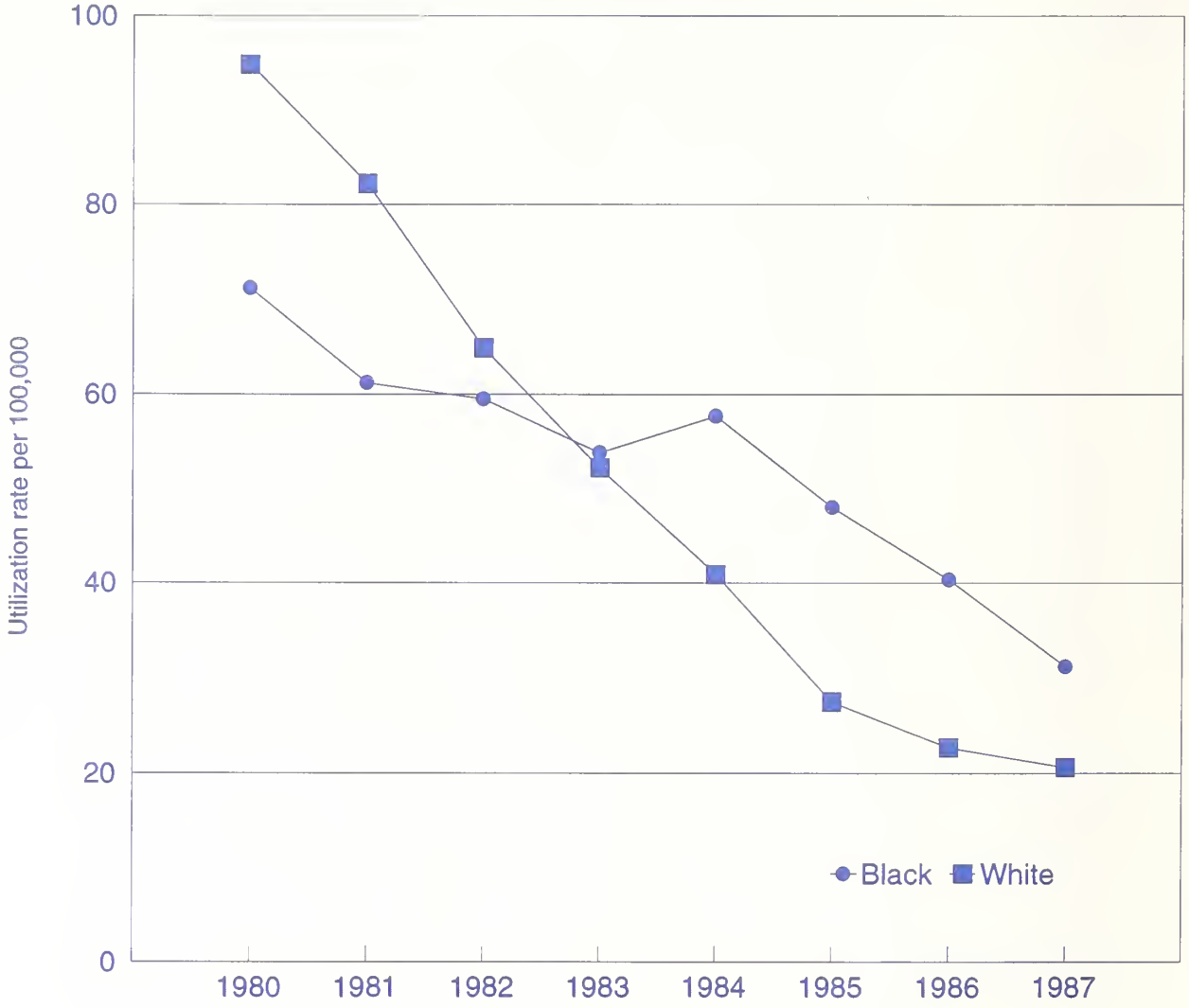
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	19.9 (13.5, 26.3)	15.8 (9.3, 22.2)	17.3 (9.8, 24.8)	20.3 (13.5, 27.0)	20.5 (13.5, 27.5)	16.9 (12.4, 21.4)	13.1 (8.5, 17.8)	9.8 (6.1, 13.5)	−6.8 (−12.3, −1.0)
White	98.5 (83.0, 114.1)	95.8 (82.5, 109.2)	91.2 (79.0, 103.4)	92.0 (79.2, 104.8)	88.8 (76.9, 100.6)	75.3 (65.2, 85.4)	58.7 (49.1, 68.4)	52.3 (40.7, 63.9)	−8.5 (−11.5, −5.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

20. Tooth procedures



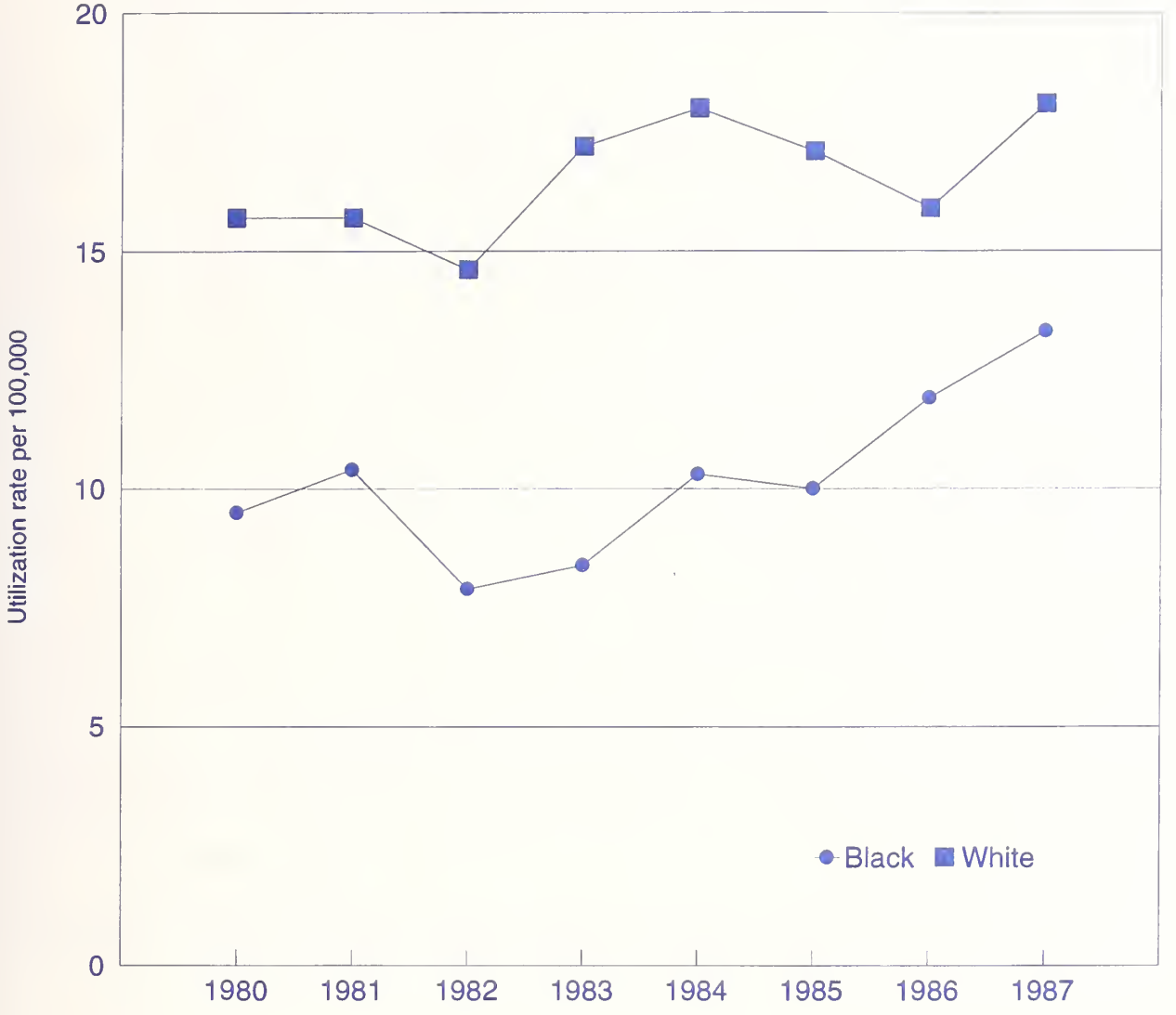
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	71.2	61.2	59.5	53.8	57.7	48.0	40.3	31.2	–9.6
	(54.5,	(44.7,	(41.1,	(38.9,	(40.0,	(31.6,	(29.7,	(20.9,	(–12.3,
	88.0)	77.7)	77.9)	68.8)	75.3)	64.3)	50.9)	41.6)	–6.7)
White	94.8	82.2	64.9	52.2	40.9	27.5	22.7	20.6	–21.1
	(80.2,	(69.3,	(54.8,	(43.3,	(34.7,	(22.7,	(17.6,	(14.1,	(–22.9,
	109.4)	95.1)	74.9)	61.2)	47.1)	32.3)	27.9)	27.1)	–19.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

21. Procedures on the mouth and palate



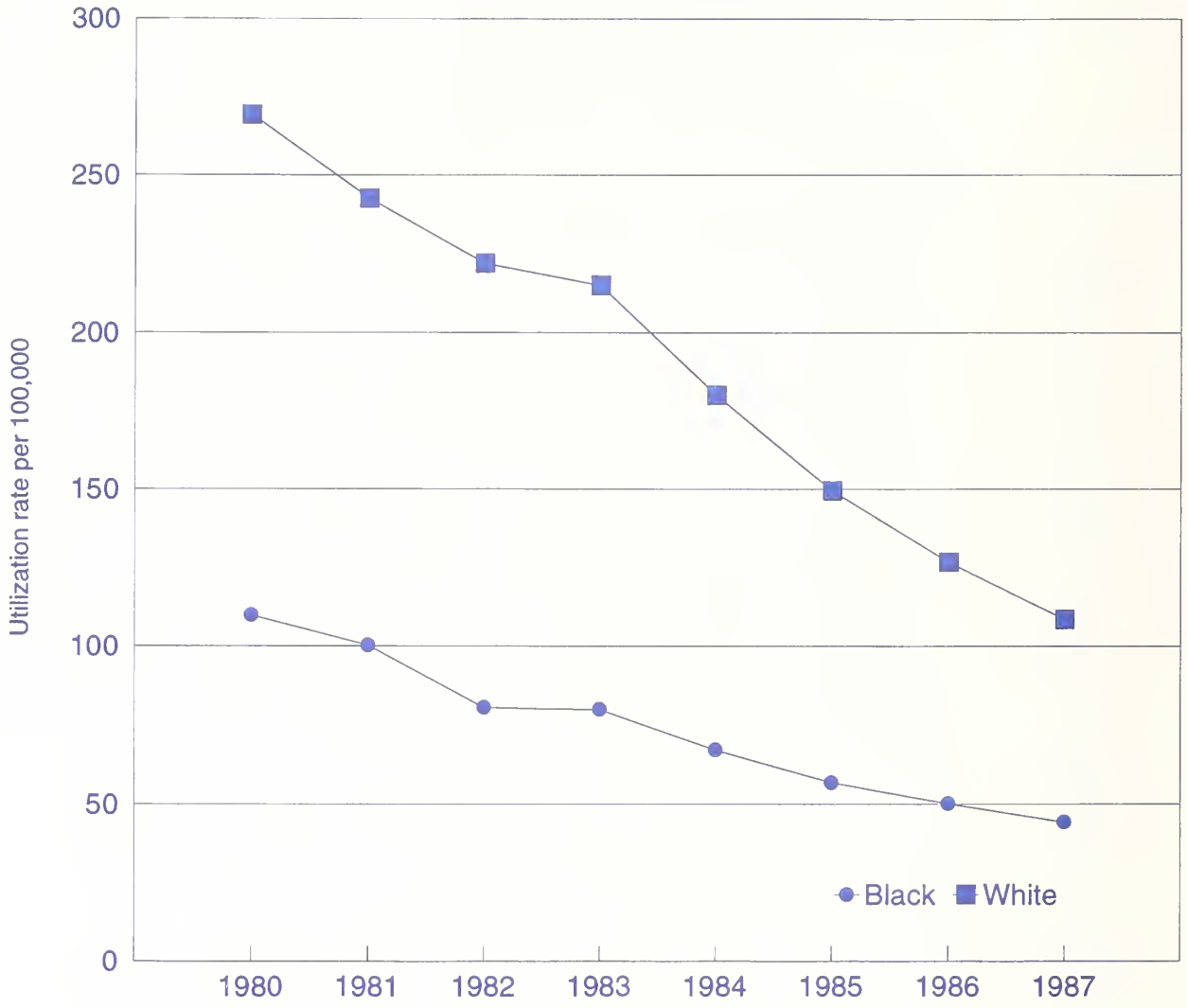
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	9.5 (6.3, 12.7)	10.4 (7.1, 13.7)	7.9 (5.7, 10.1)	8.4 (5.4, 11.3)	10.3 (6.7, 13.8)	10.0 (6.9, 13.1)	11.9 (8.1, 15.7)	13.3 (9.2, 17.5)	4.8 (0.6, 9.2)
White	15.7 (13.5, 17.8)	15.7 (13.5, 17.9)	14.6 (12.6, 16.6)	17.2 (14.8, 19.7)	18.0 (15.7, 20.3)	17.1 (14.7, 19.5)	15.9 (13.8, 18.0)	18.1 (15.6, 20.7)	1.9 (–0.1, 3.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

22. Tonsillectomy and/or adenoidectomy



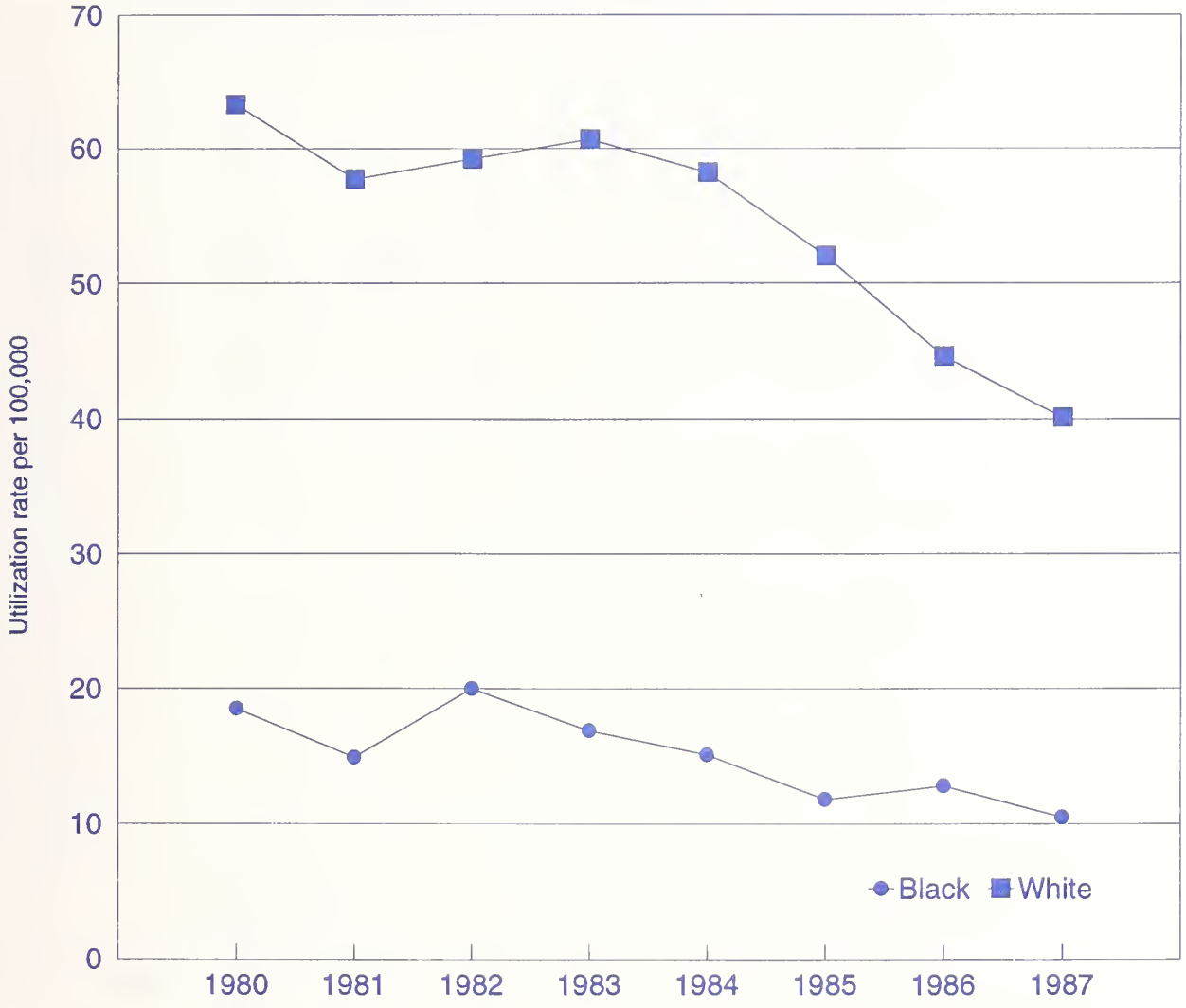
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	109.7	100.2	80.6	80.0	67.2	56.8	50.1	44.2	−12.3
	(82.7,	(80.8,	(63.5,	(59.1,	(49.8,	(43.5,	(36.2,	(32.8,	(−13.4,
	136.7)	119.5)	97.8)	100.8)	84.6)	70.1)	64.0)	55.7)	−11.3)
White	269.2	242.6	221.9	215.0	180.1	149.4	126.5	108.4	−12.3
	(236.4,	(216.2,	(197.8,	(191.4,	(159.2,	(130.5,	(106.0,	(89.0,	(−13.9,
	302.0)	268.9)	246.0)	238.6)	200.9)	168.3)	147.0)	127.9)	−10.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

23. Other procedures on nose, fracture repair



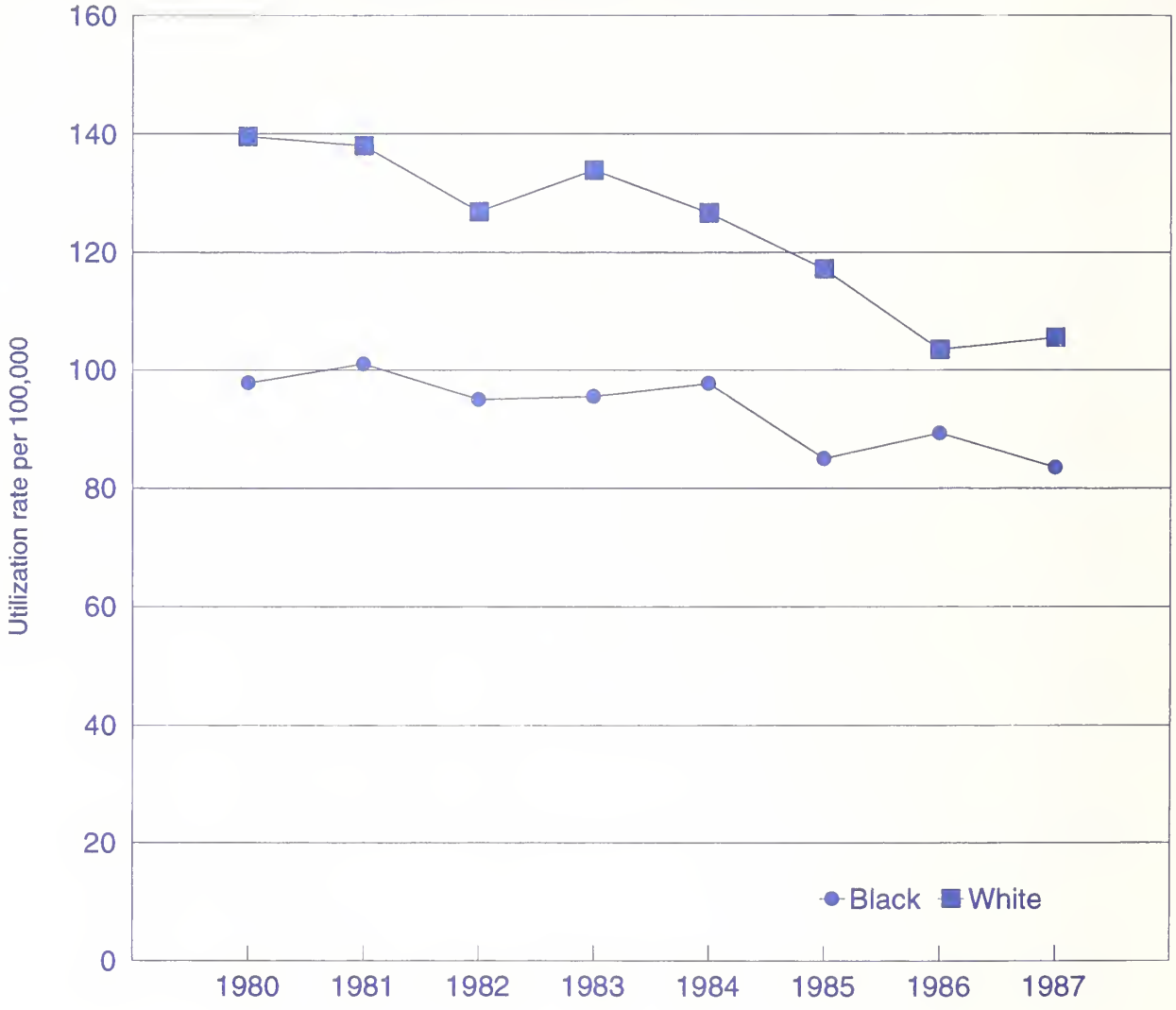
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	18.5 (14.0, 23.1)	14.9 (10.5, 19.2)	20.0 (15.0, 25.1)	16.9 (11.5, 22.4)	15.1 (11.4, 18.9)	11.8 (8.1, 15.5)	12.8 (8.6, 16.9)	10.5 (7.0, 14.0)	−7.4 (−11.0, −3.6)
White	63.3 (52.5, 74.1)	57.7 (48.0, 67.4)	59.2 (49.1, 69.2)	60.7 (50.0, 71.4)	58.2 (48.0, 68.3)	52.0 (42.5, 61.4)	44.6 (36.1, 53.1)	40.1 (29.7, 50.4)	−5.7 (−8.0, −3.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

24. Other procedures on the nasopharynx



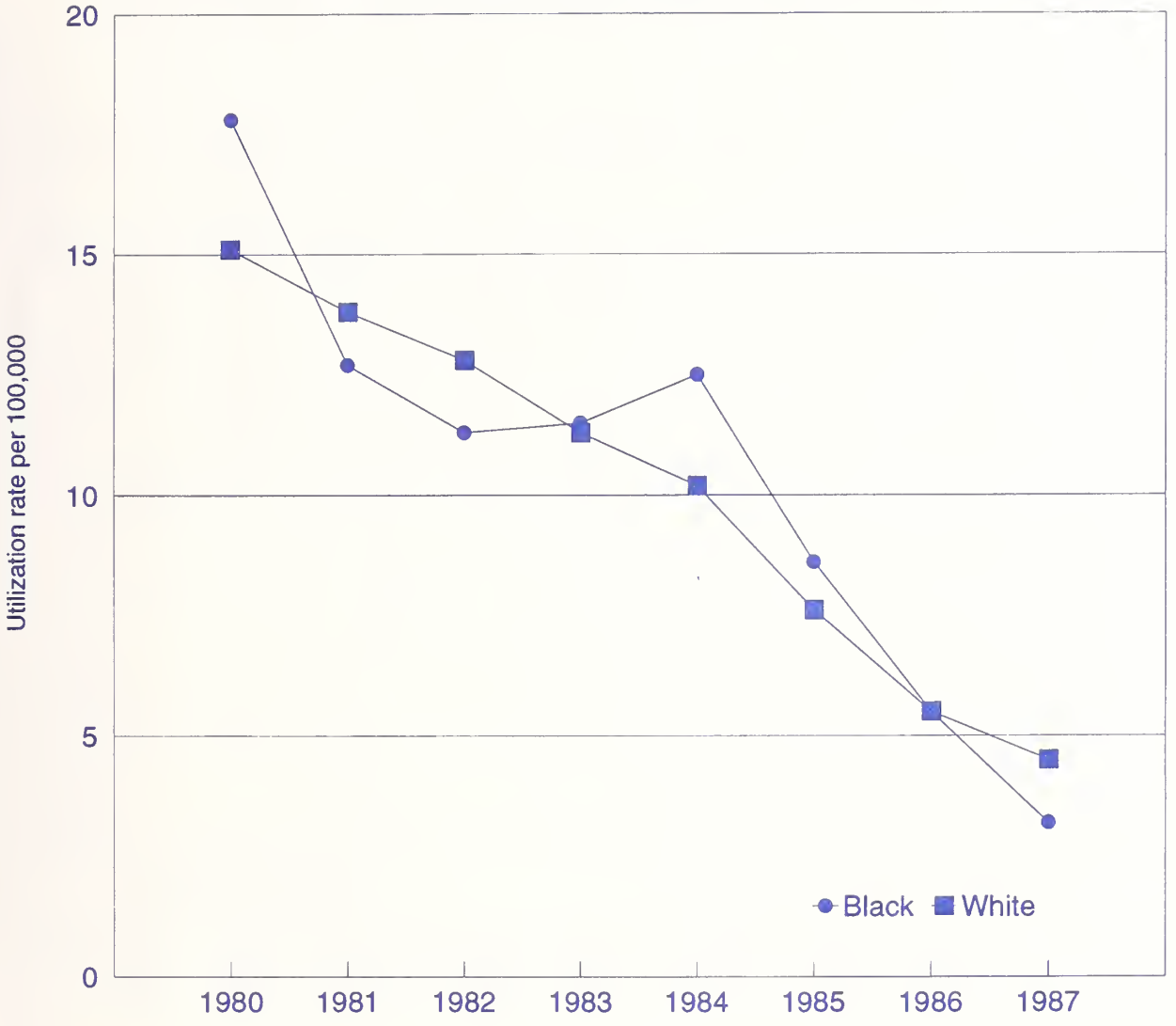
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	97.8 (75.6, 120.0)	101.0 (83.3, 118.6)	95.0 (76.6, 113.4)	95.5 (74.0, 117.1)	97.7 (77.6, 117.8)	85.0 (66.4, 103.7)	89.3 (66.5, 112.2)	83.5 (67.2, 99.9)	−2.4 (−3.6, −1.2)
White	139.5 (124.5, 154.5)	138.0 (124.0, 152.1)	126.9 (113.8, 139.9)	133.9 (118.2, 149.7)	126.7 (111.6, 141.7)	117.2 (102.5, 131.9)	103.5 (87.7, 119.3)	105.5 (87.1, 123.8)	−4.3 (−5.6, −2.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

25. Excision lesion of larynx



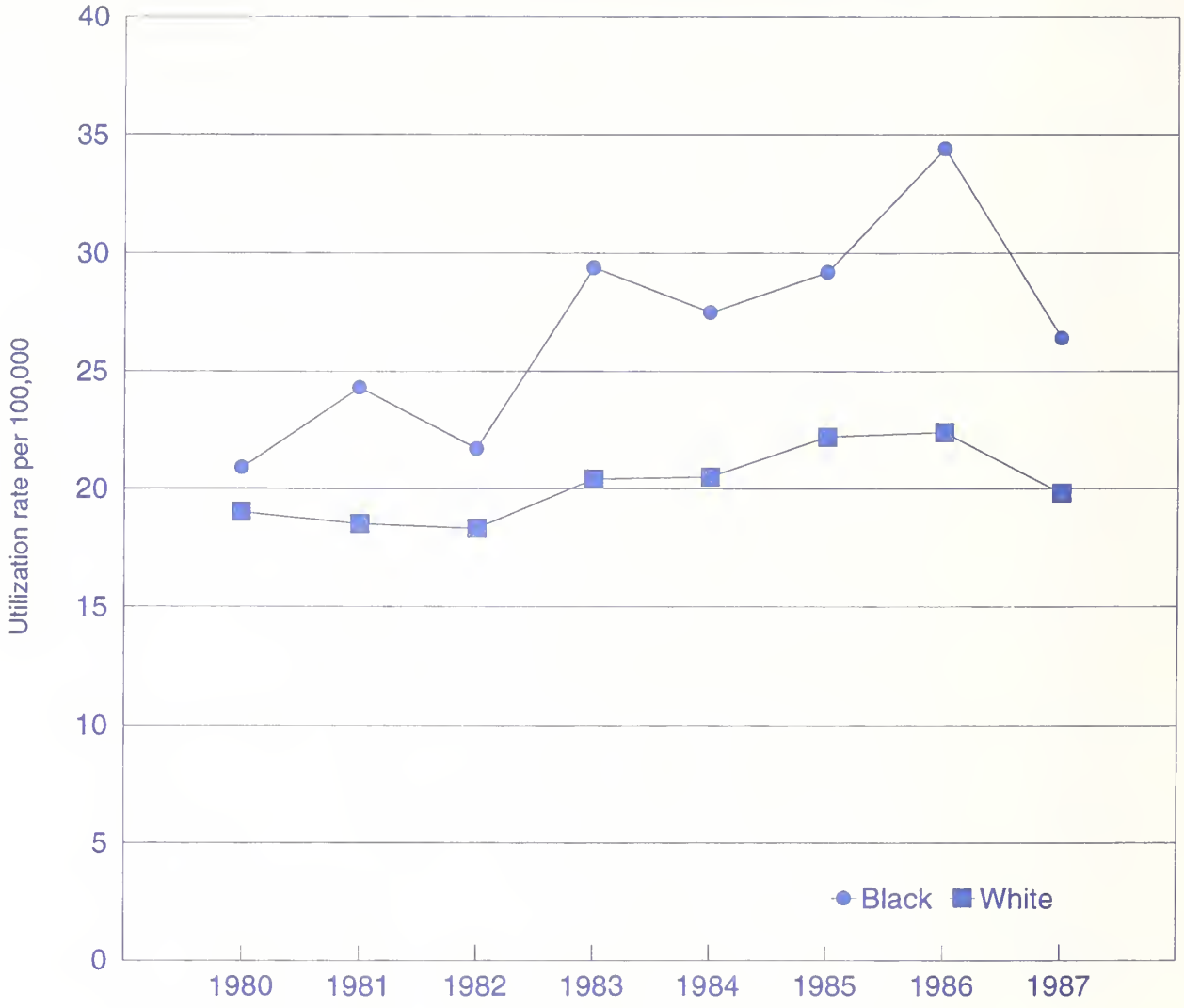
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	17.8	12.7	11.3	11.5	12.5	8.6	5.5	3.2	−18.3
	(10.2,	(4.0,	(8.0,	(7.0,	(7.5,	(4.8,	(3.0,	(1.0,	(−24.5,
	25.5)	21.3)	14.6)	16.0)	17.6)	12.3)	8.1)	5.4)	−11.6)
White	15.1	13.8	12.8	11.3	10.2	7.6	5.5	4.5	−16.1
	(13.0,	(11.7,	(10.6,	(9.3,	(8.3,	(6.1,	(4.1,	(3.4,	(−19.2,
	17.2)	15.8)	14.9)	13.3)	12.1)	9.2)	6.9)	5.6)	−12.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

26. Tracheostomy, temporary and permanent



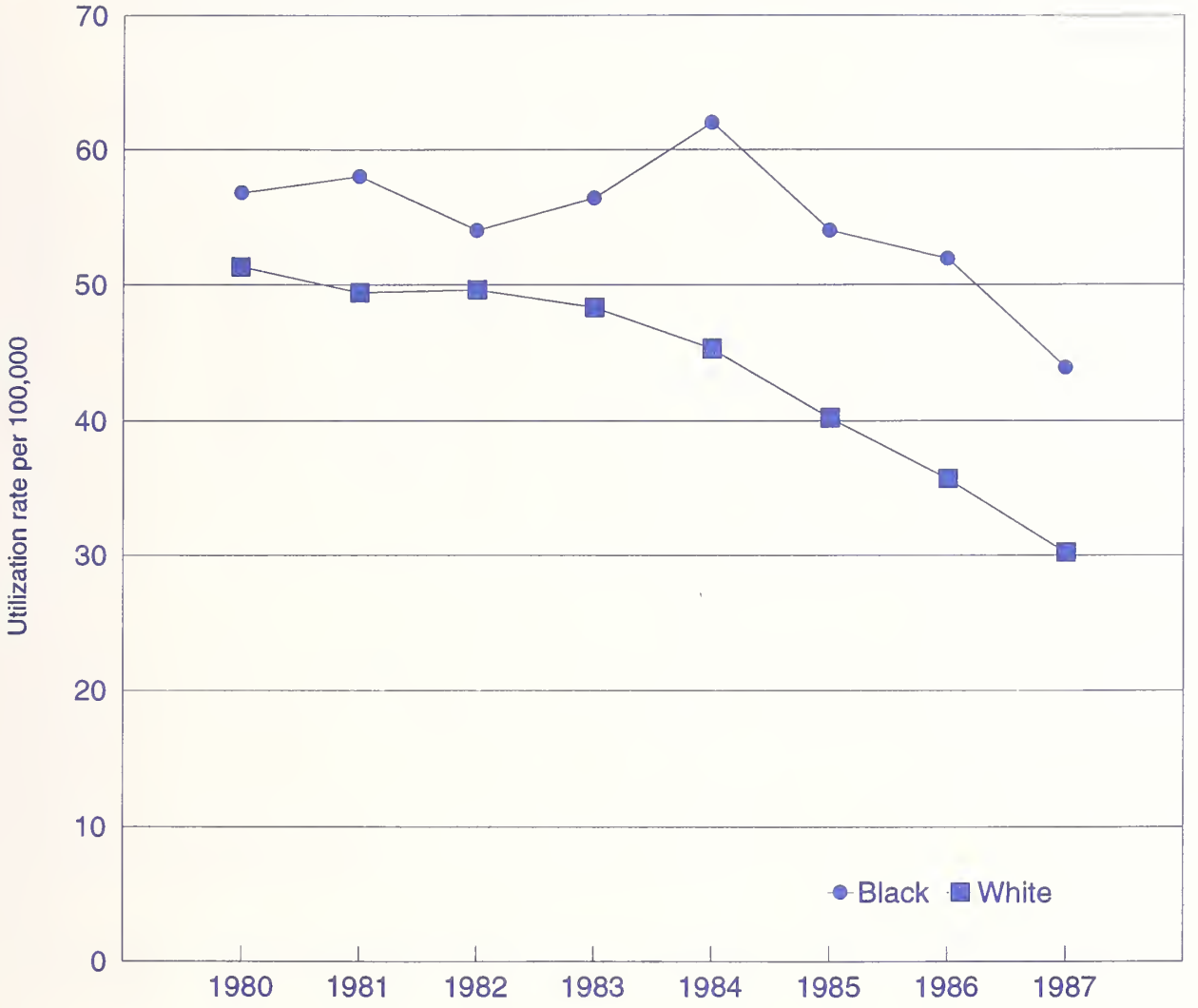
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	20.9 (15.0, 26.8)	24.3 (17.2, 31.3)	21.7 (15.6, 27.7)	29.4 (21.4, 37.4)	27.5 (19.6, 35.4)	29.2 (21.2, 37.2)	34.4 (25.3, 43.5)	26.4 (17.7, 35.1)	5.2 (1.4, 9.1)
White	19.0 (17.0, 20.9)	18.5 (16.7, 20.3)	18.3 (16.3, 20.3)	20.4 (18.3, 22.4)	20.5 (18.5, 22.6)	22.2 (20.1, 24.3)	22.4 (20.2, 24.6)	19.8 (17.8, 21.8)	2.2 (0.4, 4.0)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

27. Tracheoscopy, laryngoscopy (including biopsy)



Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	56.8 (40.6, 73.1)	58.0 (43.6, 72.3)	54.0 (39.5, 68.5)	56.4 (40.4, 72.4)	62.0 (42.5, 81.5)	54.0 (38.0, 69.9)	51.9 (35.0, 68.7)	43.9 (31.3, 56.5)	−2.7 (−5.1, −0.2)
White	51.3 (45.5, 57.1)	49.4 (43.2, 55.5)	49.6 (43.6, 55.6)	48.3 (42.5, 54.1)	45.3 (39.8, 50.9)	40.2 (34.2, 46.1)	35.7 (29.8, 41.5)	30.2 (25.9, 34.5)	−6.9 (−9.1, −4.8)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

28. Lobectomy or pneumonectomy

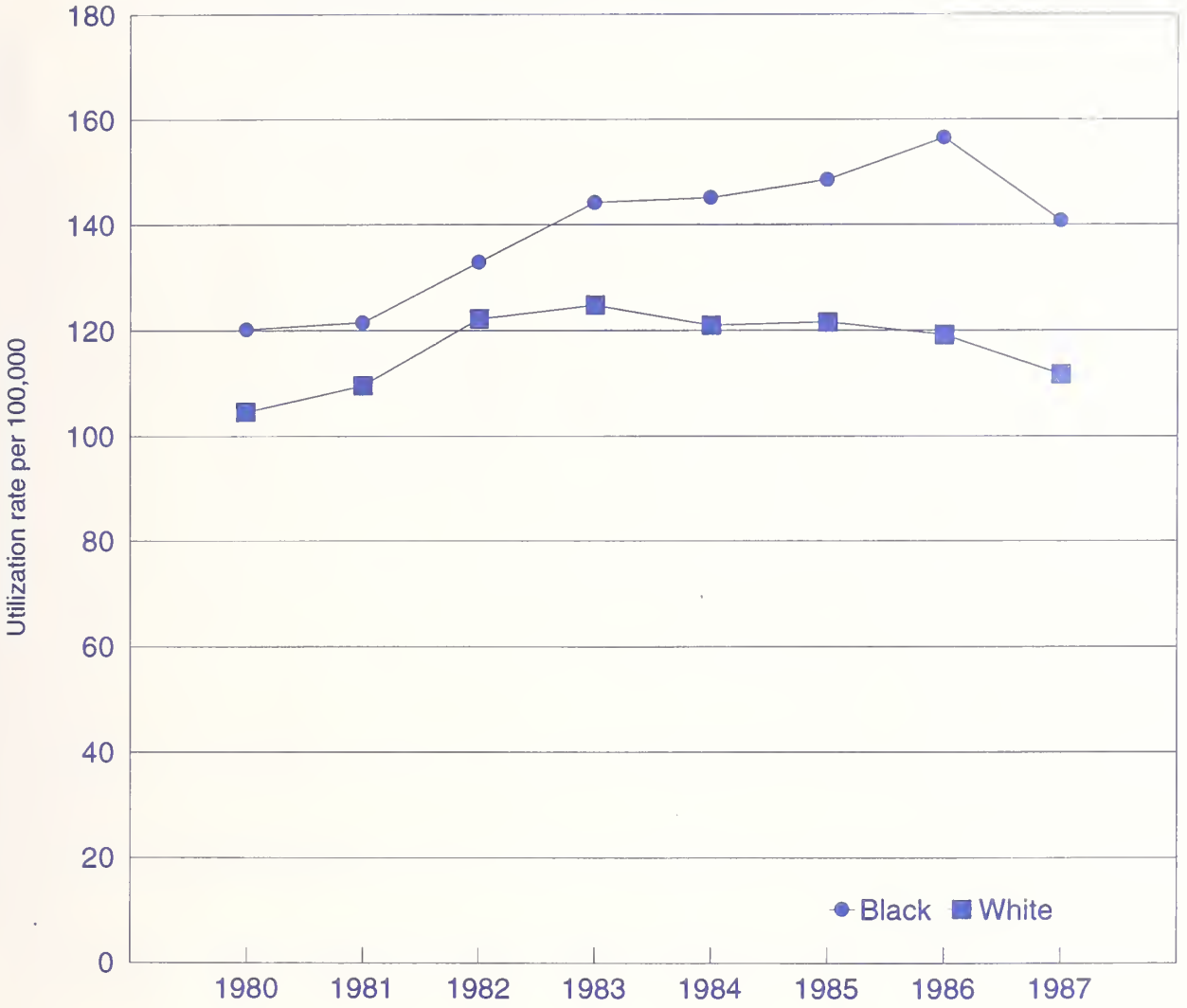
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	11.4 (7.6, 15.1)	11.8 (7.8, 15.7)	12.7 (8.9, 16.4)	11.5 (6.8, 16.3)	12.9 (9.1, 16.7)	10.5 (7.4, 13.6)	12.8 (8.9, 16.7)	17.6 (9.8, 25.5)	3.7 (–0.6, 8.1)
White	13.0 (11.7, 14.4)	12.5 (10.9, 14.0)	15.5 (14.0, 17.0)	14.9 (13.1, 16.8)	14.7 (13.2, 16.1)	14.6 (12.7, 16.4)	14.7 (12.8, 16.6)	14.0 (12.4, 15.7)	1.4 (–0.8, 3.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

29. Bronchoscopy and biopsy of bronchus



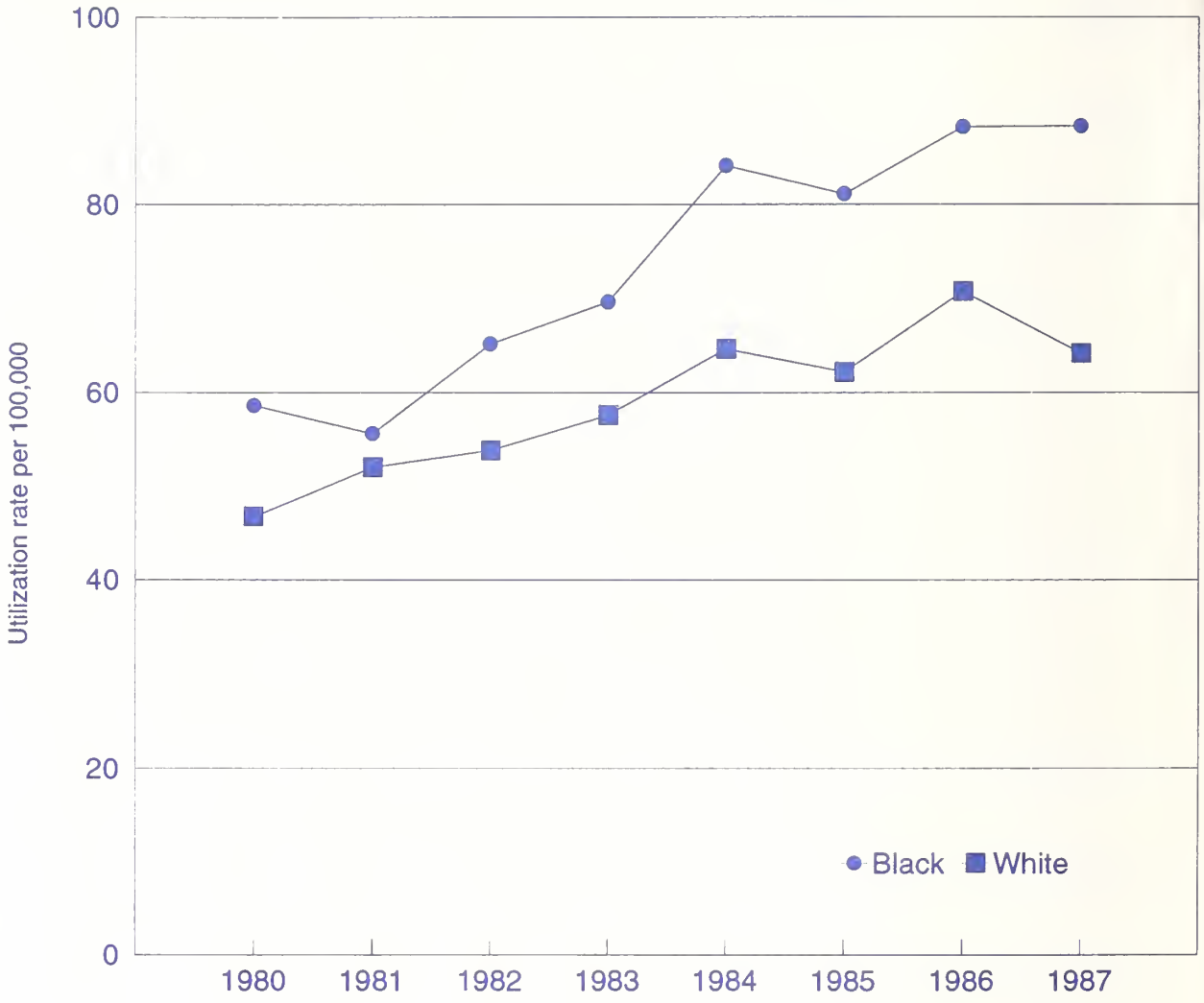
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	120.2 (94.5, 145.9)	121.5 (101.0, 142.0)	132.9 (106.1, 159.8)	144.2 (114.3, 174.1)	145.1 (119.5, 170.7)	148.5 (116.0, 181.1)	156.5 (113.7, 199.4)	140.7 (105.3, 176.1)	3.3 (1.5, 5.1)
White	104.6 (96.7, 112.6)	109.6 (101.5, 117.8)	122.2 (113.0, 131.5)	124.8 (114.5, 135.0)	121.0 (110.4, 131.5)	121.6 (109.1, 134.1)	119.2 (107.8, 130.6)	111.7 (100.3, 123.1)	1.0 (–0.9, 2.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

30. Thoracotomy, chest drainage



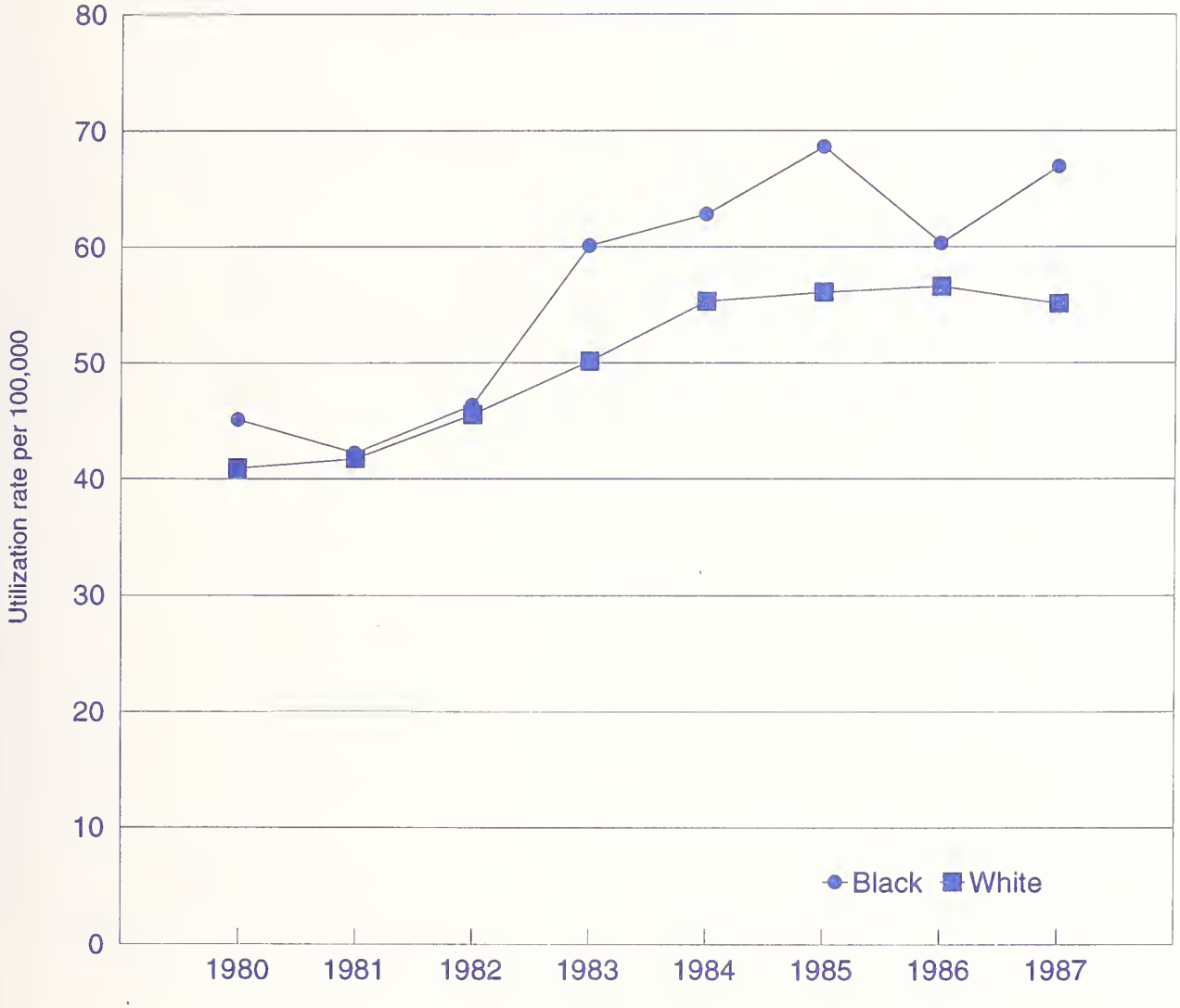
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	58.6 (44.7, 72.4)	55.6 (43.6, 67.7)	65.2 (50.5, 80.0)	69.7 (54.9, 84.5)	84.1 (64.9, 103.2)	81.1 (65.0, 97.2)	88.2 (62.9, 113.4)	88.3 (63.8, 112.8)	7.4 (5.4, 9.5)
White	46.7 (41.7, 51.6)	52.0 (46.8, 57.2)	53.8 (48.0, 59.6)	57.6 (52.3, 62.9)	64.7 (57.1, 72.4)	62.2 (56.7, 67.6)	70.8 (62.4, 79.1)	64.2 (58.3, 70.2)	5.3 (3.5, 7.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

31. Thoracentesis



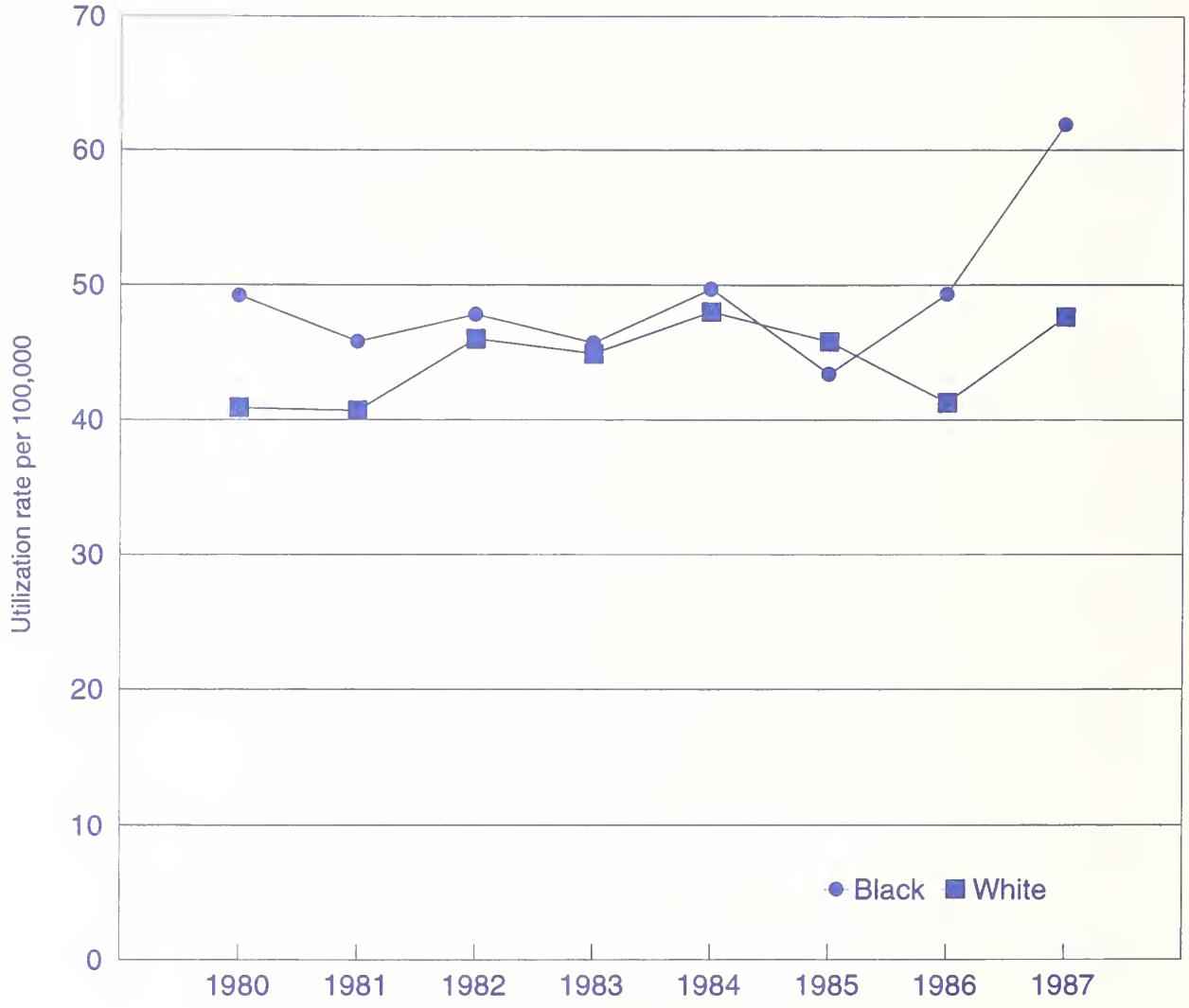
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	45.1 (33.0, 57.2)	42.2 (32.5, 51.9)	46.3 (33.8, 58.8)	60.1 (44.9, 75.3)	62.8 (49.1, 76.4)	68.6 (53.3, 83.9)	60.3 (42.6, 77.9)	66.9 (49.7, 84.1)	7.1 (3.9, 10.4)
White	40.9 (37.0, 44.7)	41.7 (38.1, 45.3)	45.5 (41.5, 49.5)	50.1 (46.2, 54.1)	55.3 (50.8, 59.8)	56.1 (51.2, 61.1)	56.6 (52.0, 61.2)	55.1 (49.9, 60.3)	5.3 (3.6, 7.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

32. Other respiratory diagnostic procedures



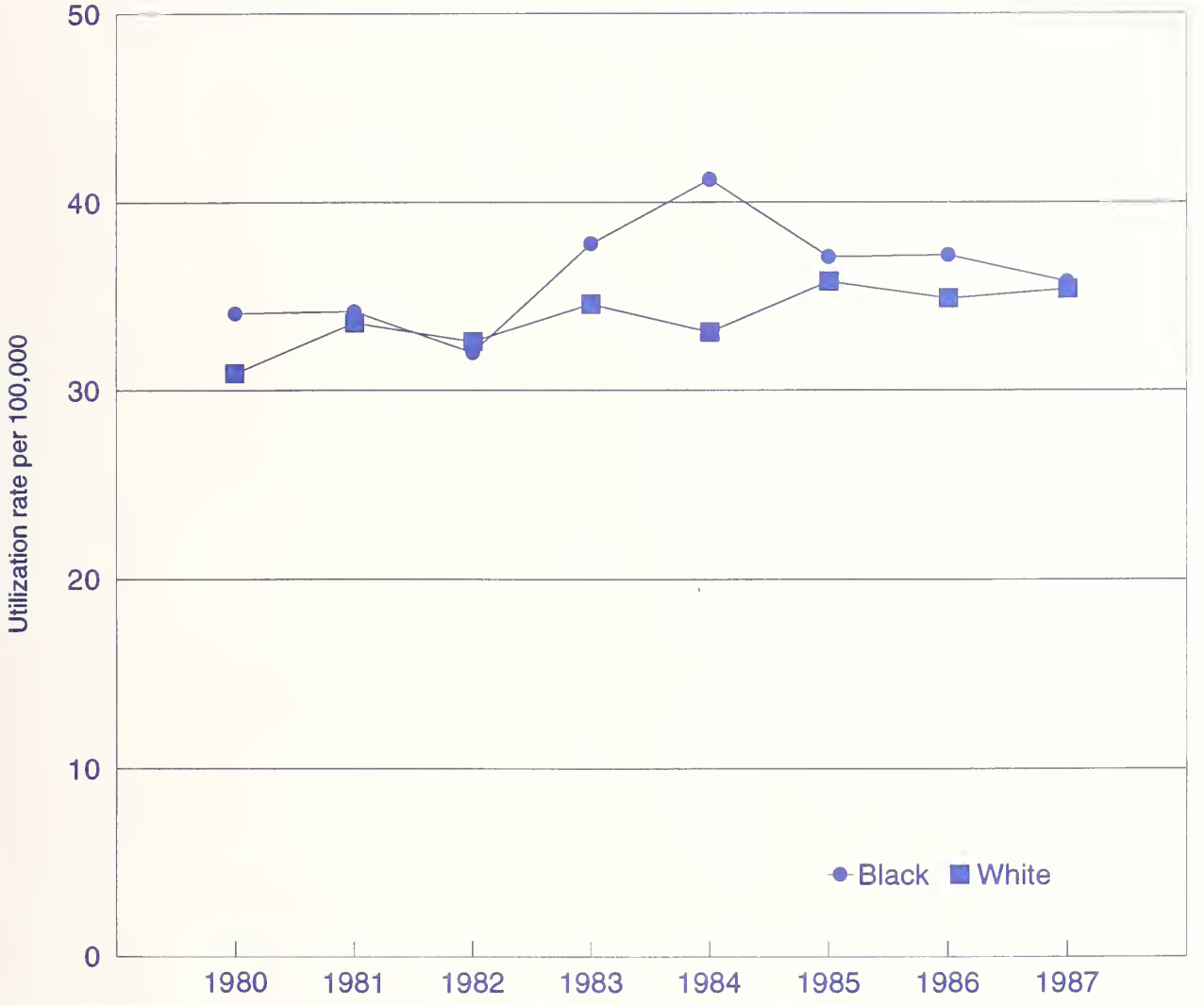
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	49.2 (37.8, 60.6)	45.8 (36.3, 55.4)	47.8 (37.3, 58.3)	45.7 (33.6, 57.7)	49.7 (40.4, 59.0)	43.4 (33.9, 53.0)	49.3 (33.1, 65.5)	61.9 (42.1, 81.8)	2.1 (–0.9, 5.3)
White	40.9 (36.3, 45.5)	40.7 (36.7, 44.8)	46.0 (41.6, 50.4)	44.9 (40.5, 49.2)	48.0 (43.0, 53.0)	45.8 (40.2, 51.5)	41.3 (36.6, 45.9)	47.6 (41.0, 54.1)	1.4 (–0.5, 3.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

33. Other procedures on respiratory system



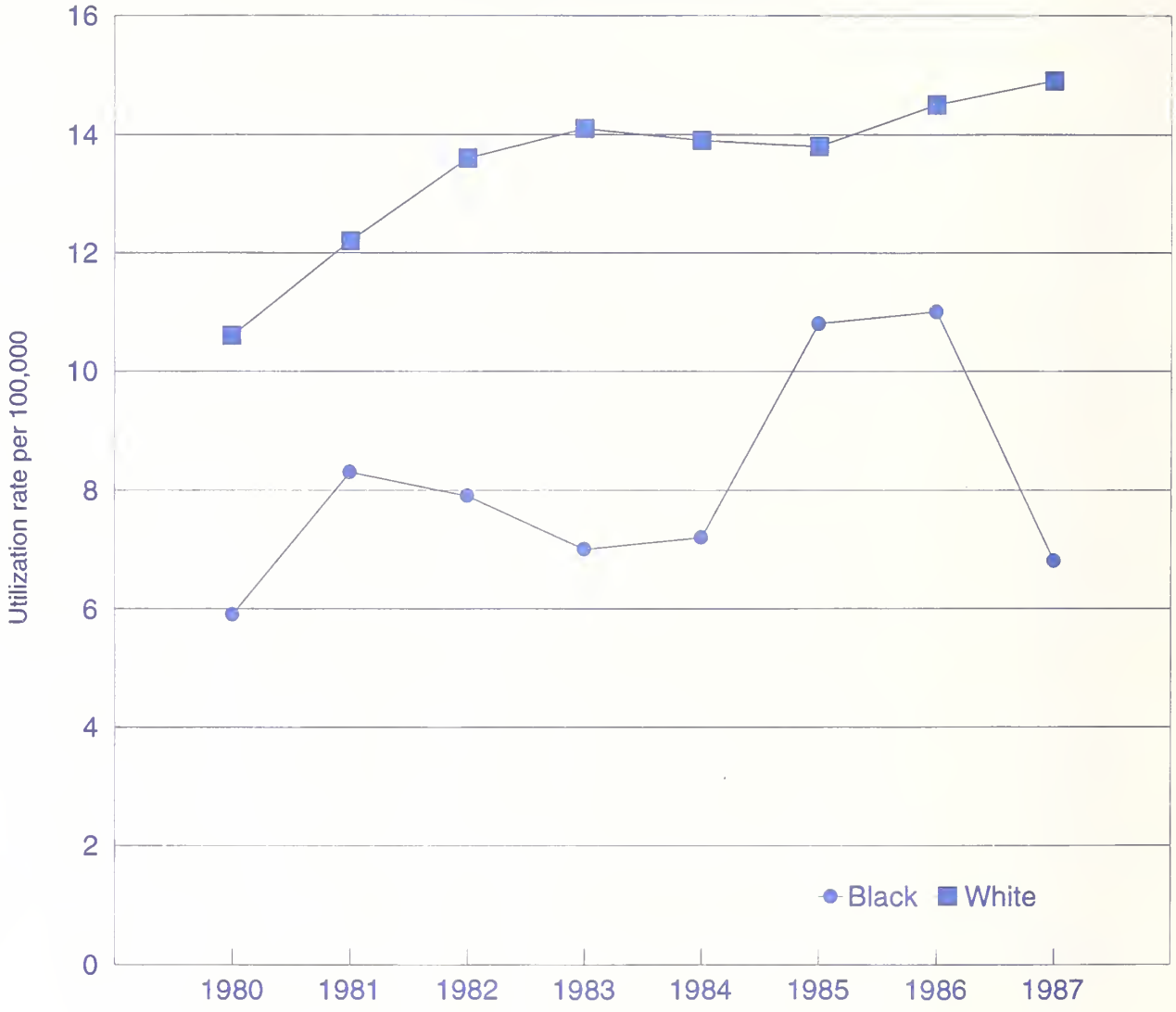
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	34.1 (26.4, 41.7)	34.2 (25.6, 42.8)	32.0 (23.4, 40.6)	37.8 (29.0, 46.6)	41.2 (31.3, 51.1)	37.1 (29.3, 45.0)	37.2 (27.6, 46.9)	35.8 (27.5, 44.1)	1.6 (–0.6, 3.8)
White	30.9 (27.7, 34.1)	33.6 (30.4, 36.8)	32.6 (29.3, 35.9)	34.6 (31.2, 38.0)	33.1 (29.8, 36.5)	35.8 (32.0, 39.6)	34.9 (31.4, 38.4)	35.4 (32.0, 38.9)	1.7 (0.7, 2.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

34. Heart valve procedures



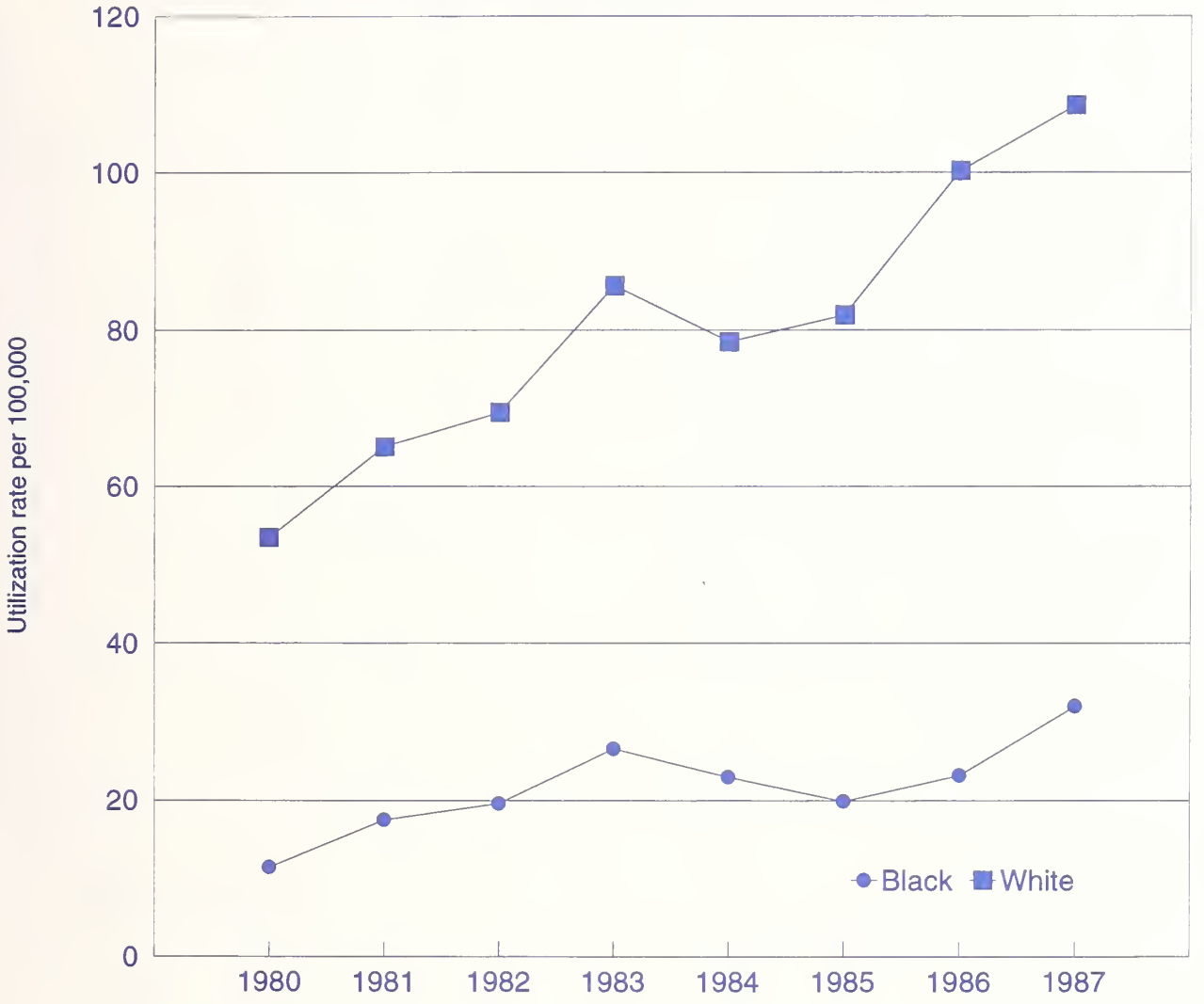
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	5.9 (3.2, 8.6)	8.3 (5.1, 11.6)	7.9 (3.7, 12.1)	7.0 (3.7, 10.3)	7.2 (3.0, 11.5)	10.8 (5.6, 16.0)	11.0 (6.1, 16.0)	6.8 (3.7, 9.9)	4.1 (−2.4, 11.1)
White	10.6 (7.8, 13.3)	12.2 (9.2, 15.1)	13.6 (10.3, 17.0)	14.1 (10.8, 17.4)	13.9 (10.7, 17.2)	13.8 (10.7, 16.9)	14.5 (11.3, 17.8)	14.9 (11.1, 18.6)	4.0 (2.1, 6.0)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

35. Coronary artery bypass graft (CABG)



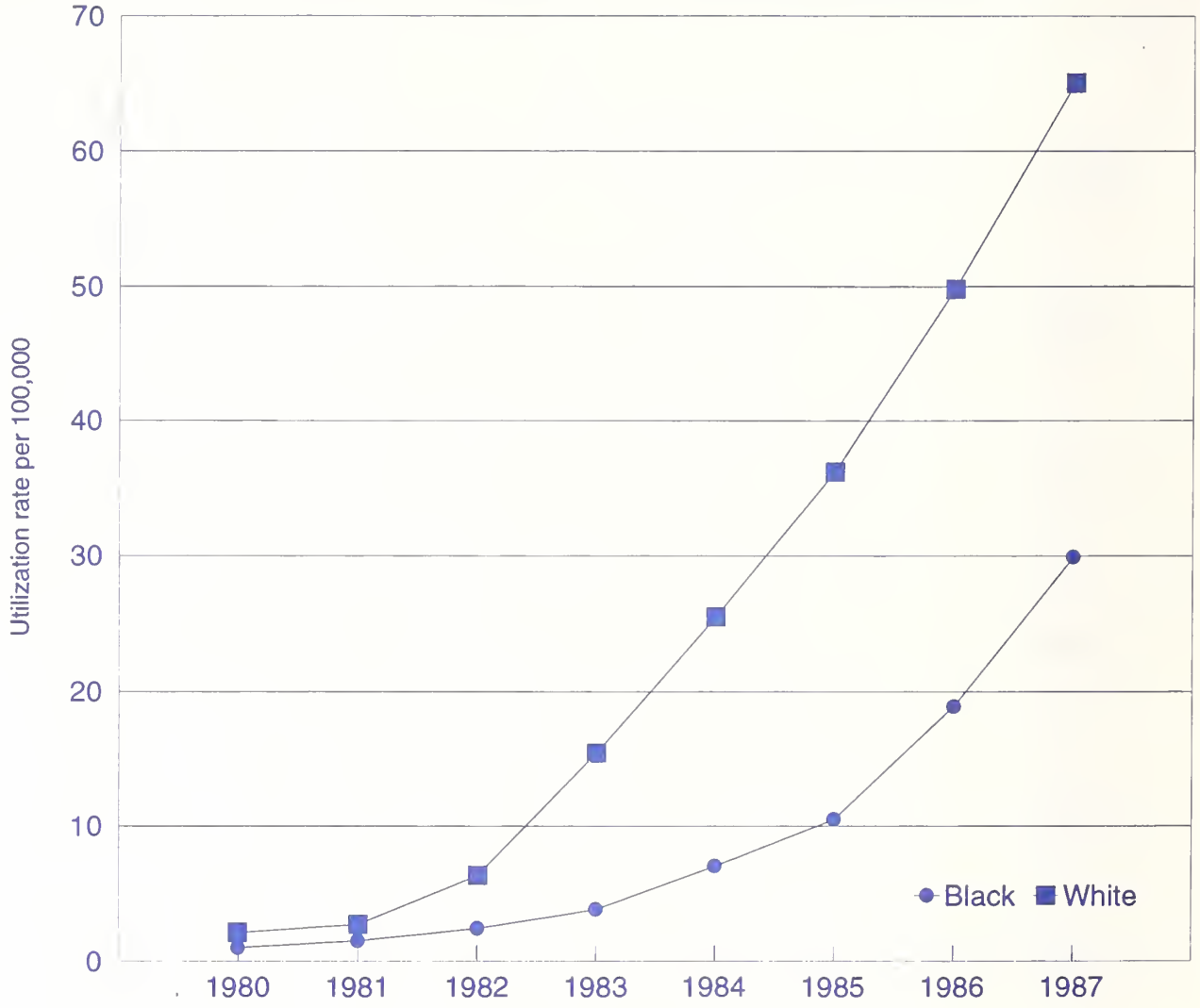
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	11.4 (5.3, 17.5)	17.5 (6.4, 28.6)	19.6 (8.3, 30.8)	26.6 (15.0, 38.3)	23.0 (12.0, 34.0)	19.9 (13.4, 26.4)	23.2 (14.4, 32.0)	32.0 (21.3, 42.8)	10.7 (4.3, 17.5)
White	53.4 (39.2, 67.7)	65.1 (48.3, 81.9)	69.5 (50.6, 88.3)	85.6 (60.7, 110.6)	78.5 (60.6, 96.4)	81.9 (61.5, 102.3)	100.2 (75.5, 124.9)	108.6 (80.5, 136.7)	9.4 (6.9, 11.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

36. Percutaneous transluminal coronary angioplasty (PTCA)



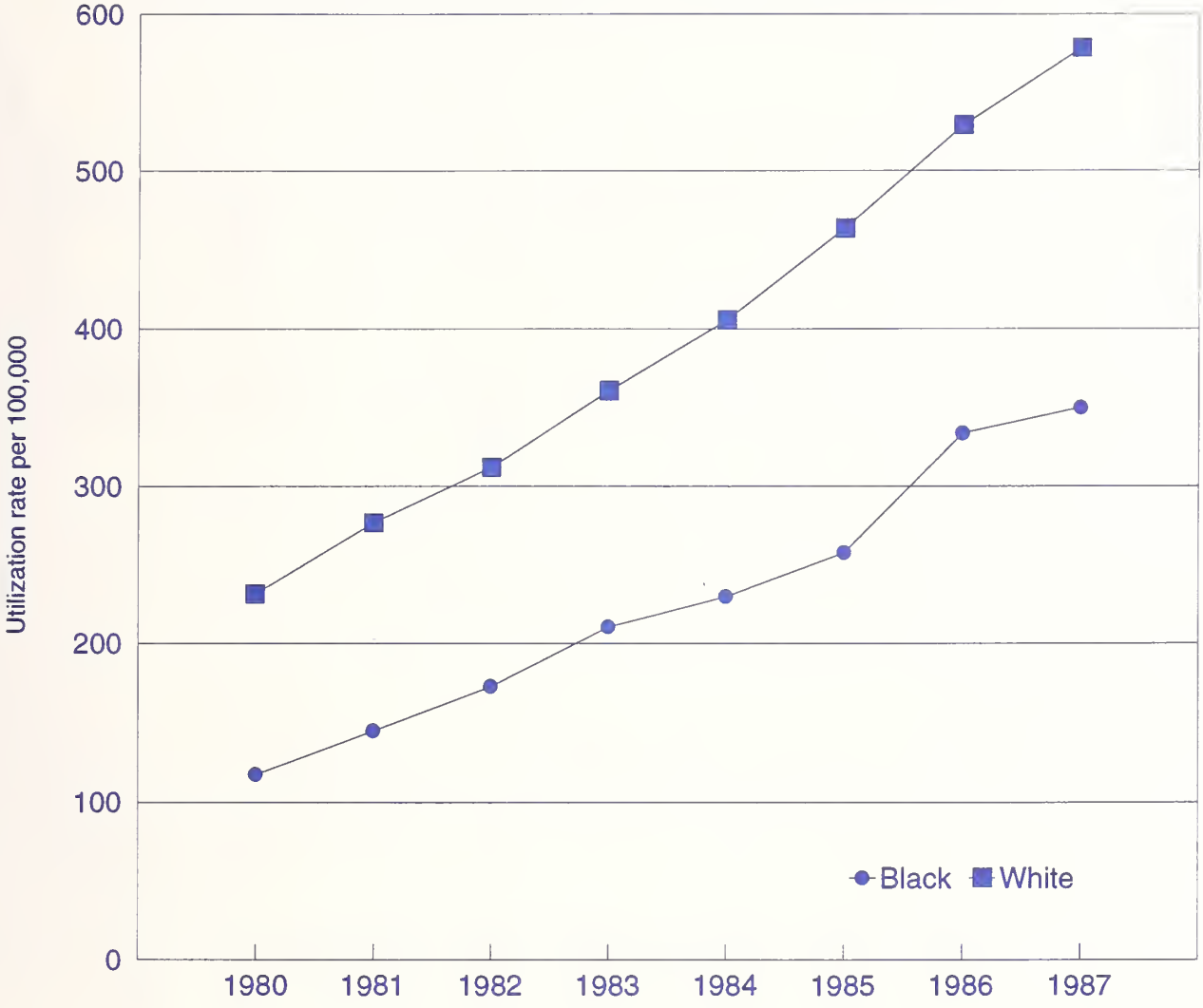
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	1.0 (0.3, 1.7)	1.5 (0.5, 2.5)	2.4 (0.9, 4.0)	3.8 (1.3, 6.3)	7.0 (2.0, 12.1)	10.5 (6.4, 14.5)	18.9 (8.4, 29.4)	29.9 (12.0, 47.8)	64.0 (61.3, 66.7)
White	2.1 (1.0, 3.1)	2.7 (1.6, 3.9)	6.3 (3.5, 9.2)	15.4 (9.5, 21.3)	25.5 (18.6, 32.4)	36.2 (26.8, 45.7)	49.8 (36.2, 63.4)	65.0 (48.3, 81.7)	69.7 (56.0, 84.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

37. Cardiac catheterization, coronary arteriography



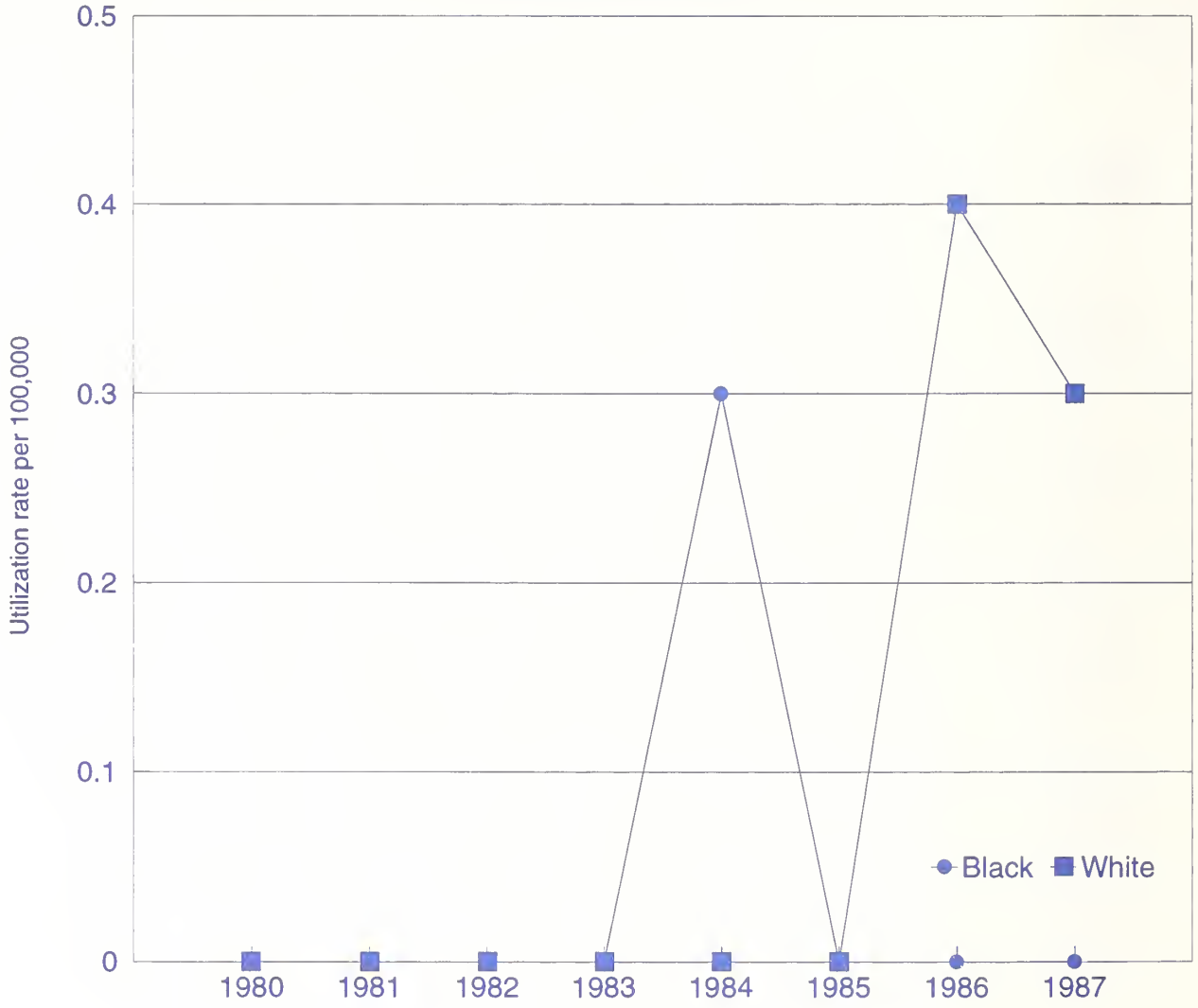
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	117.3 (78.6, 156.0)	144.8 (93.9, 195.7)	172.6 (104.1, 241.1)	210.4 (140.5, 280.3)	229.5 (153.4, 305.7)	257.3 (194.8, 319.8)	333.8 (231.6, 436.0)	350.0 (232.8, 467.2)	16.9 (15.1, 18.7)
White	231.3 (182.7, 279.9)	276.4 (219.2, 333.6)	312.0 (253.3, 370.8)	360.8 (301.5, 420.1)	405.6 (341.9, 469.3)	463.3 (386.7, 539.9)	529.0 (443.9, 614.2)	578.3 (481.1, 675.4)	13.9 (13.2, 14.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

38. Heart transplant



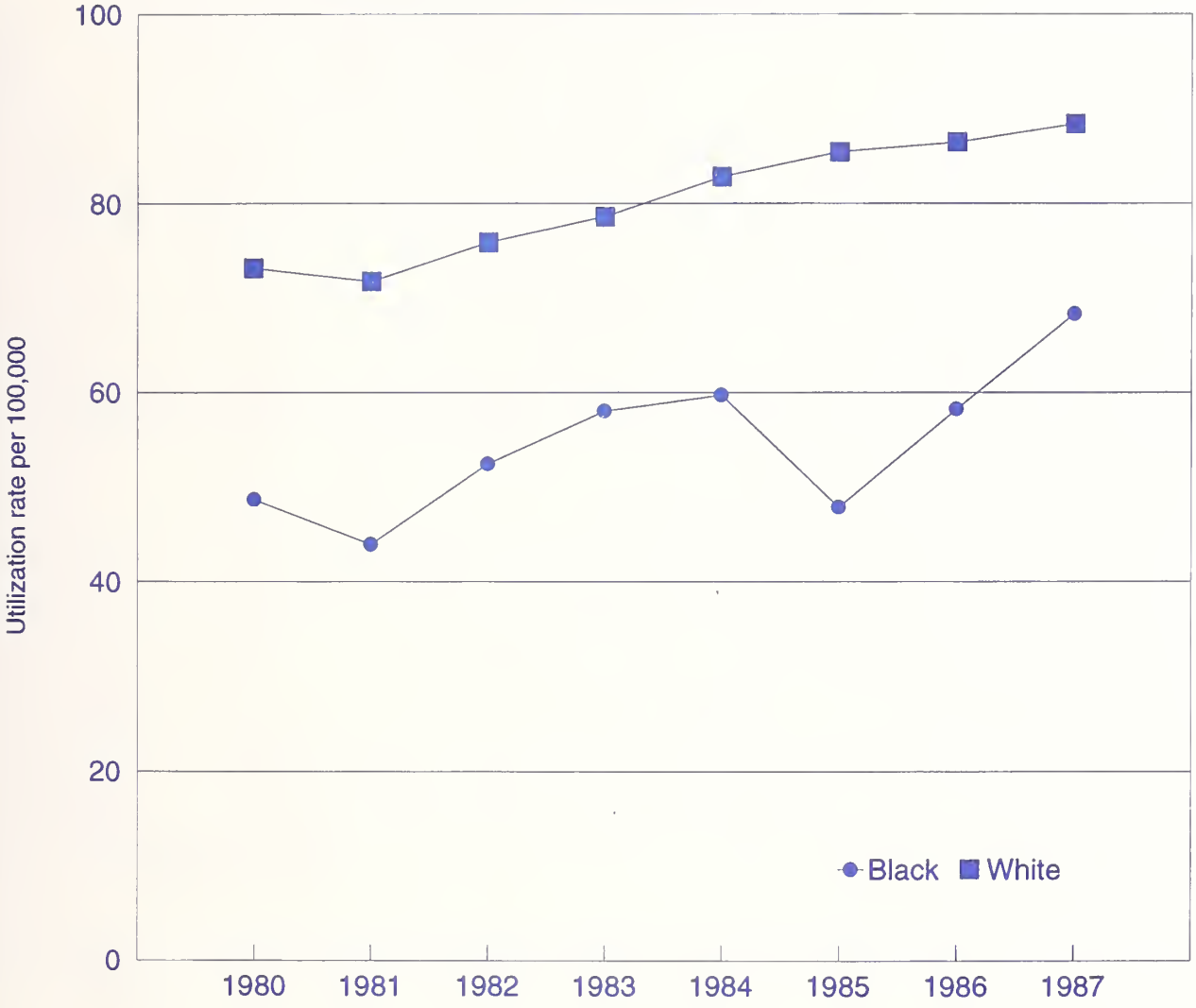
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	0 (—, —)	0 (—, —)	0 (—, —)	0 (—, —)	0.3 (0.0, 0.7)	0 (—, —)	0.0 (0.0, 0.1)	0 (—, —)	— (—, —)
White	0 (—, —)	0 (—, —)	0.0 (0.0, 0.0)	0.0 (0.0, 0.1)	0.0 (0.0, 0.0)	0.0 (0.0, 0.1)	0.4 (0.0, 0.7)	0.3 (0.0, 0.5)	— (—, —)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

39. Insertion of cardiac pacemaker



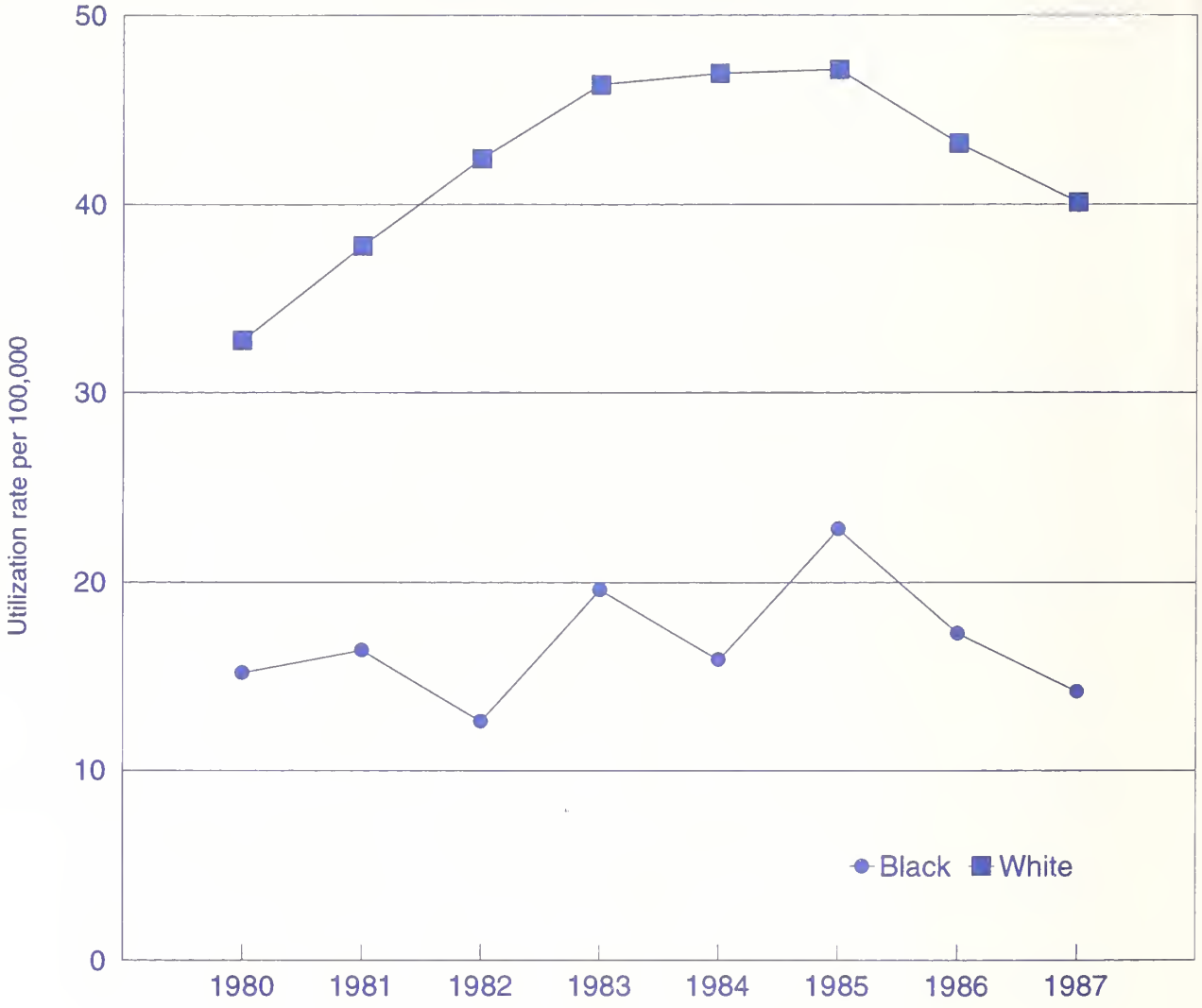
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	48.6 (37.9, 59.4)	43.9 (34.7, 53.0)	52.4 (39.3, 65.5)	58.0 (45.6, 70.4)	59.7 (46.6, 72.7)	47.8 (36.9, 58.6)	58.2 (44.8, 71.6)	68.4 (49.9, 86.9)	4.3 (0.9, 7.8)
White	73.2 (66.4, 79.9)	71.8 (65.7, 77.9)	75.9 (69.8, 82.0)	78.6 (72.3, 84.9)	82.8 (75.9, 89.6)	85.4 (77.0, 93.9)	86.4 (75.9, 96.8)	88.3 (77.0, 99.7)	3.2 (2.6, 3.8)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

40. Endarterectomy (any vessel)



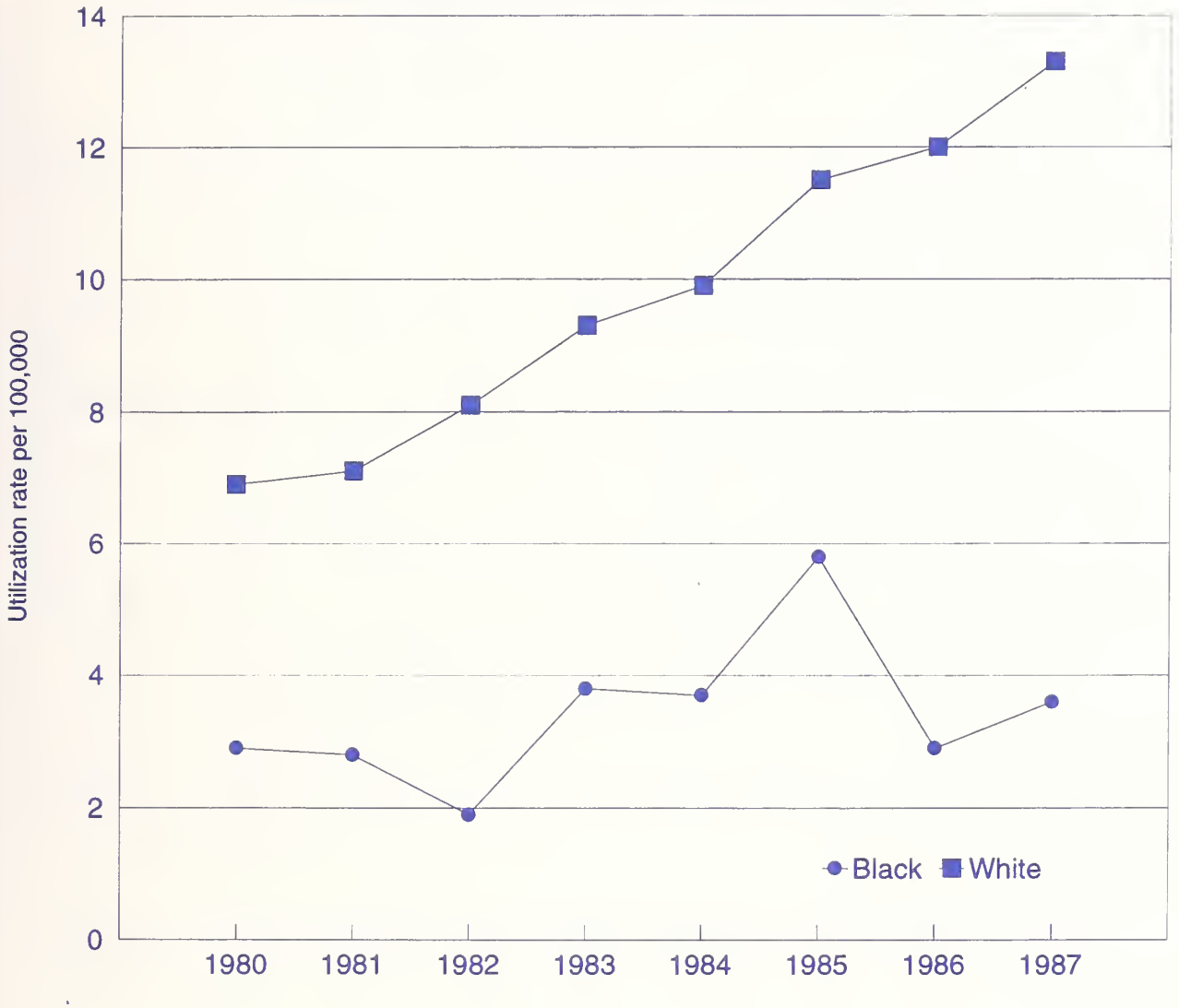
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	15.2 (9.8, 20.5)	16.4 (11.9, 20.9)	12.6 (9.0, 16.1)	19.6 (13.7, 25.5)	15.9 (10.8, 20.9)	22.8 (16.3, 29.3)	17.3 (11.3, 23.3)	14.2 (9.0, 19.3)	1.6 (–4.2, 7.9)
White	32.8 (29.2, 36.4)	37.8 (33.4, 42.3)	42.4 (37.8, 47.1)	46.3 (41.0, 51.6)	46.9 (41.8, 52.0)	47.1 (41.9, 52.3)	43.2 (37.9, 48.6)	40.1 (34.5, 45.6)	2.9 (–0.6, 6.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

41. Aortic resection with replacement



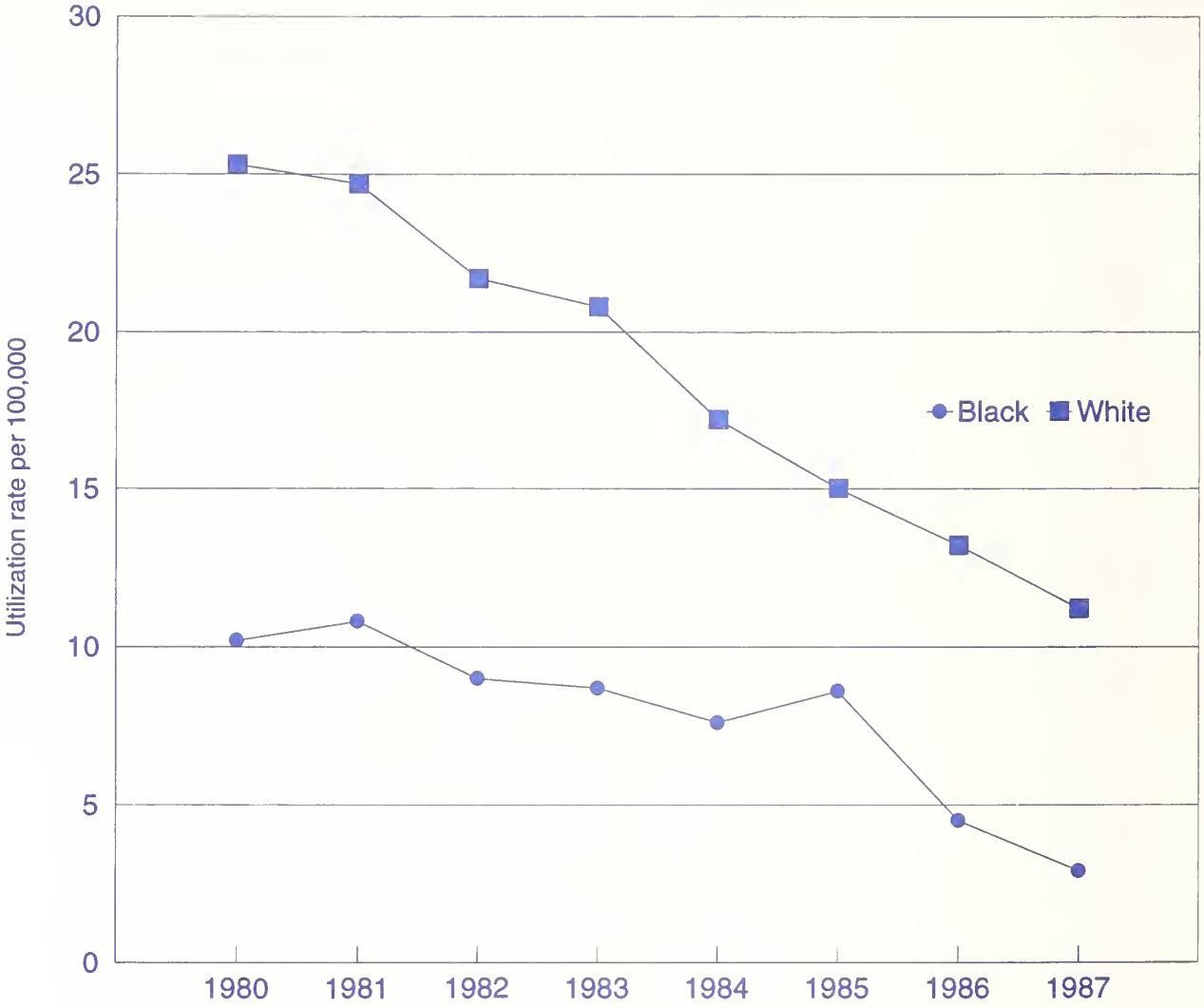
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	2.9 (1.4, 4.3)	2.8 (1.3, 4.3)	1.9 (0.7, 3.1)	3.8 (1.8, 5.9)	3.7 (1.9, 5.5)	5.8 (3.7, 8.0)	2.9 (1.5, 4.2)	3.6 (1.7, 5.5)	6.4 (−3.3, 17.0)
White	6.9 (5.7, 8.2)	7.1 (5.8, 8.3)	8.1 (6.7, 9.4)	9.3 (7.8, 10.7)	9.9 (8.6, 11.2)	11.5 (10.0, 13.1)	12.0 (10.4, 13.5)	13.3 (11.1, 15.5)	10.4 (9.3, 11.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

42. Varicose vein stripping



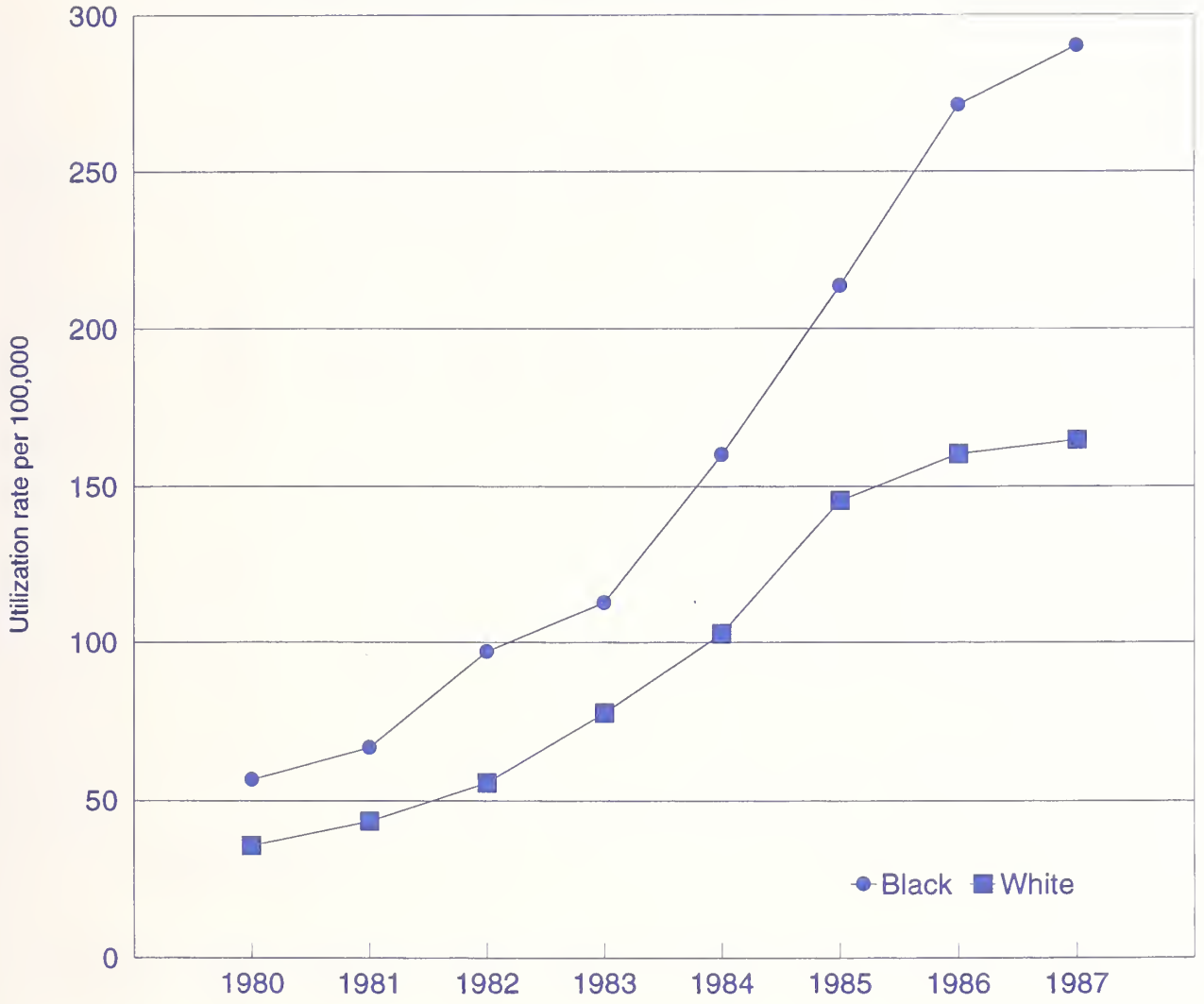
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	10.2	10.8	9.0	8.7	7.6	8.6	4.5	2.9	−14.8
	(6.1,	(6.8,	(5.6,	(5.7,	(5.1,	(5.9,	(2.5,	(1.6,	(−21.1,
	14.4)	14.8)	12.3)	11.8)	10.1)	11.3)	6.6)	4.2)	−8.1)
White	25.3	24.7	21.7	20.8	17.2	15.0	13.2	11.2	−11.4
	(22.3,	(22.2,	(19.4,	(18.6,	(15.6,	(13.2,	(11.5,	(9.5,	(−12.8,
	28.3)	27.2)	24.0)	23.0)	18.8)	16.9)	14.9)	12.9)	−9.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

43. Other vascular catheterization, not heart



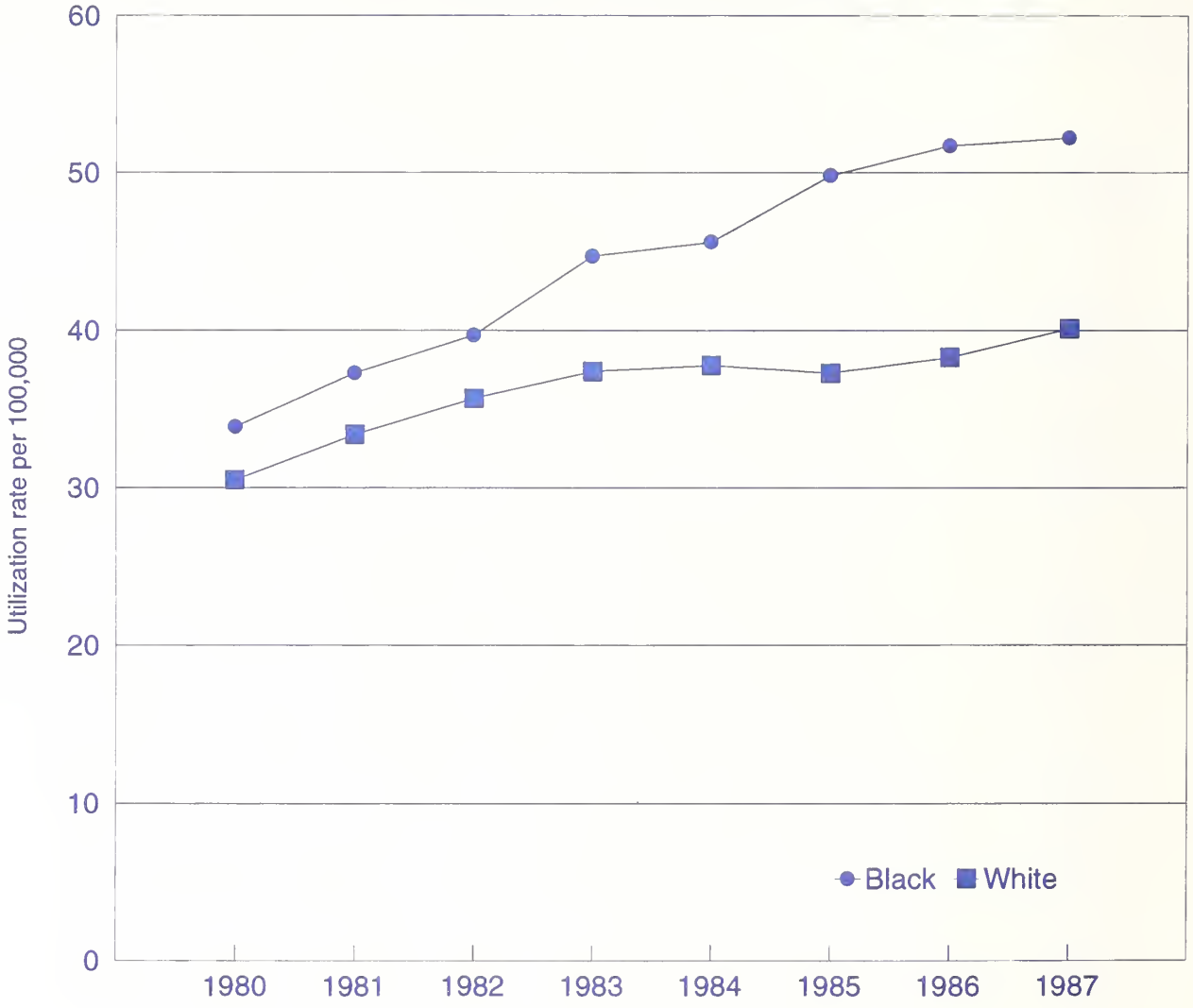
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	56.6 (32.5, 80.7)	66.7 (32.6, 100.8)	97.1 (48.5, 145.7)	112.6 (73.0, 152.2)	160.1 (107.8, 212.4)	213.5 (147.2, 279.8)	271.2 (179.5, 362.8)	290.2 (209.9, 370.4)	28.7 (25.6, 31.8)
White	35.8 (28.9, 42.6)	43.5 (35.4, 51.7)	55.6 (46.0, 65.2)	77.6 (67.0, 88.2)	102.7 (88.7, 116.6)	145.4 (122.6, 168.1)	160.3 (137.2, 183.4)	164.8 (141.8, 187.7)	27.4 (23.1, 31.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

44. Peripheral vascular bypass



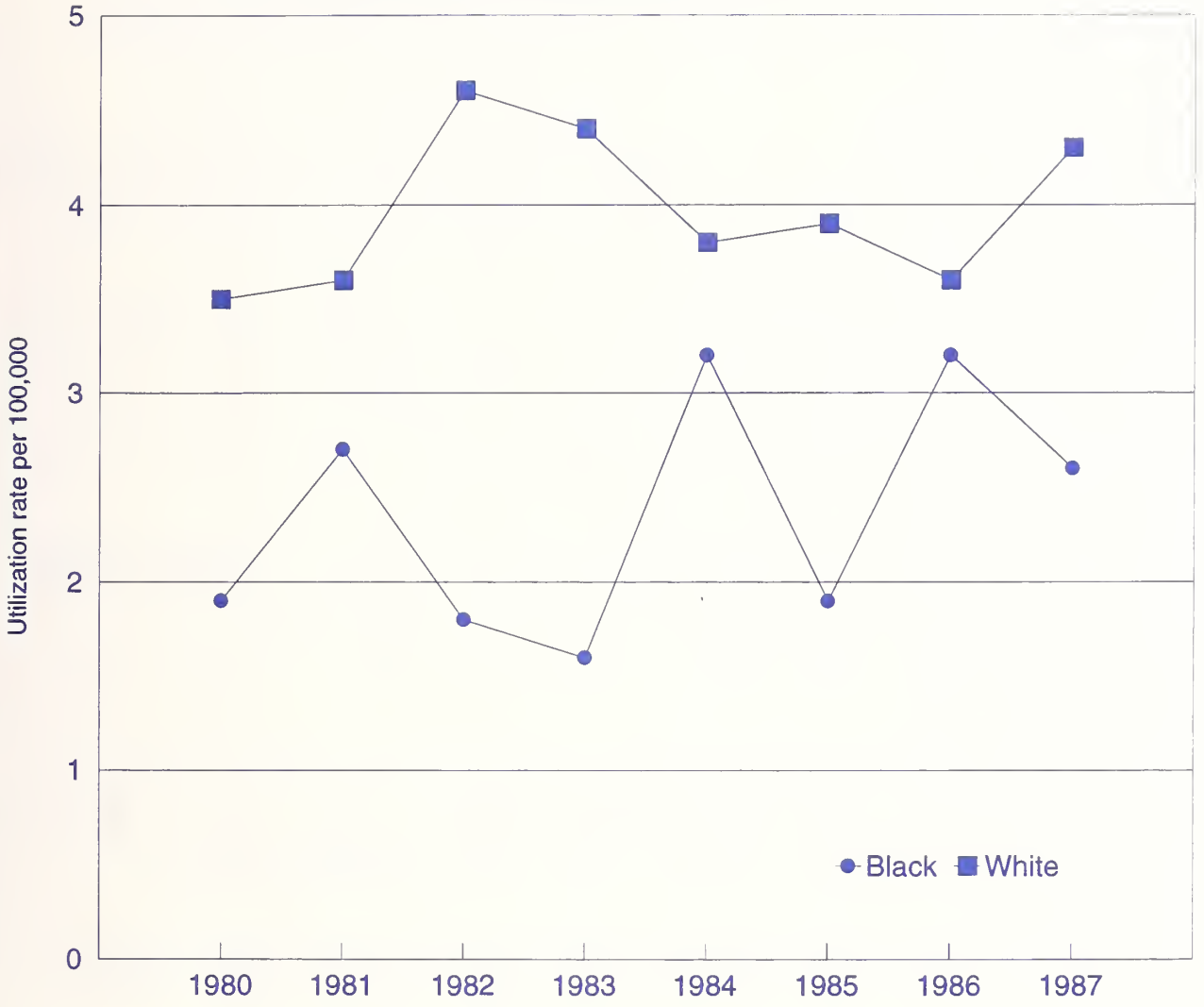
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	33.9 (25.5, 42.3)	37.3 (27.0, 47.6)	39.7 (30.3, 49.1)	44.7 (33.4, 55.9)	45.6 (34.4, 56.7)	49.8 (37.0, 62.6)	51.7 (37.0, 66.4)	52.2 (34.5, 69.9)	6.6 (5.5, 7.7)
White	30.5 (26.4, 34.7)	33.4 (29.3, 37.5)	35.7 (32.0, 39.5)	37.4 (33.3, 41.6)	37.8 (33.5, 42.1)	37.3 (33.0, 41.5)	38.3 (33.6, 43.0)	40.1 (34.5, 45.7)	3.3 (2.1, 4.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

45. Other vascular bypass and shunt, not heart



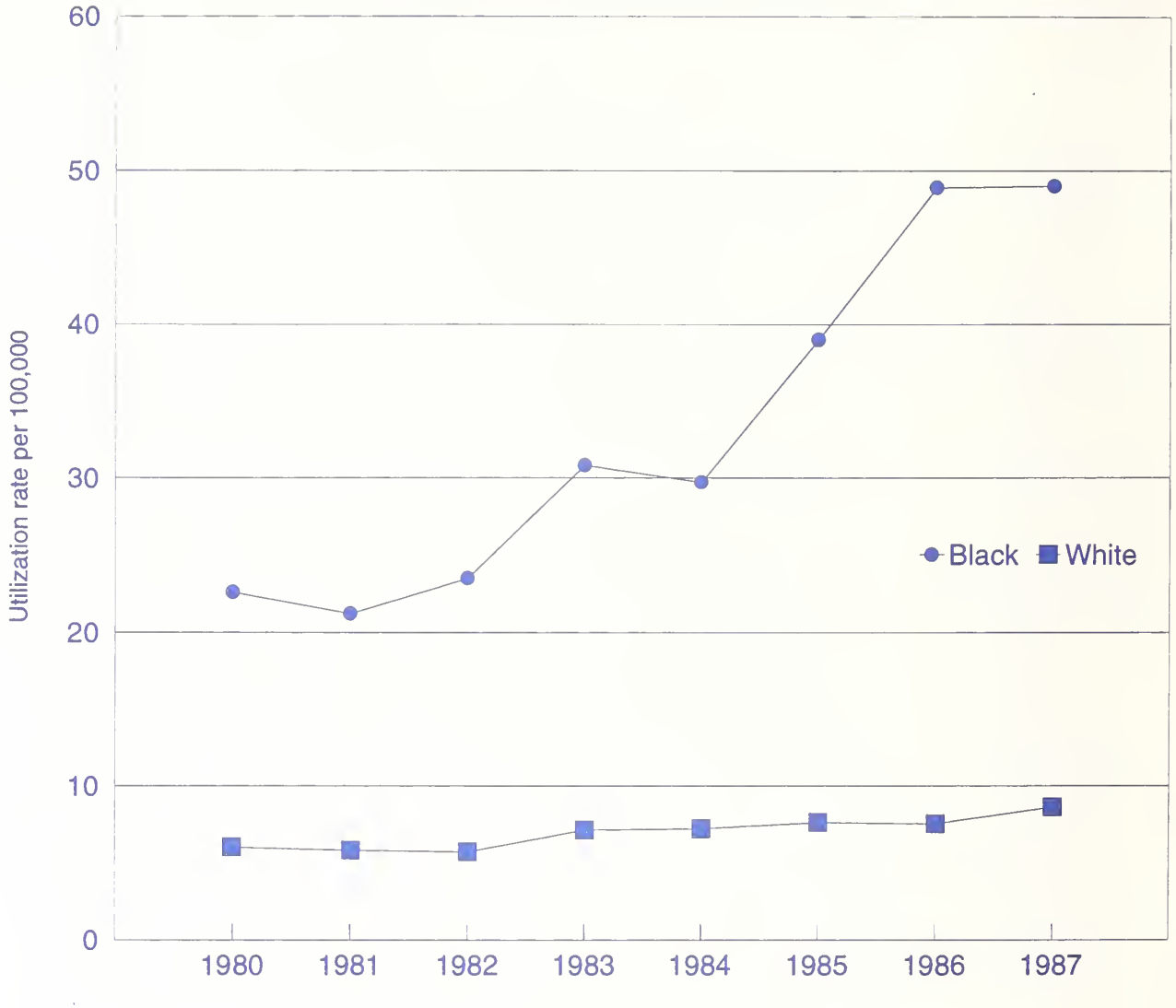
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	1.9 (0.8, 2.9)	2.7 (1.4, 3.9)	1.8 (0.1, 3.6)	1.6 (0.4, 2.7)	3.2 (1.5, 4.8)	1.9 (0.7, 3.1)	3.2 (1.6, 4.9)	2.6 (0.7, 4.4)	4.8 (−3.5, 13.7)
White	3.5 (2.8, 4.3)	3.6 (2.9, 4.3)	4.6 (3.7, 5.5)	4.4 (3.3, 5.6)	3.8 (3.1, 4.5)	3.9 (2.9, 4.8)	3.6 (2.8, 4.3)	4.3 (3.2, 5.5)	0.8 (−2.4, 4.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

46. Creation of arteriovenous fistula



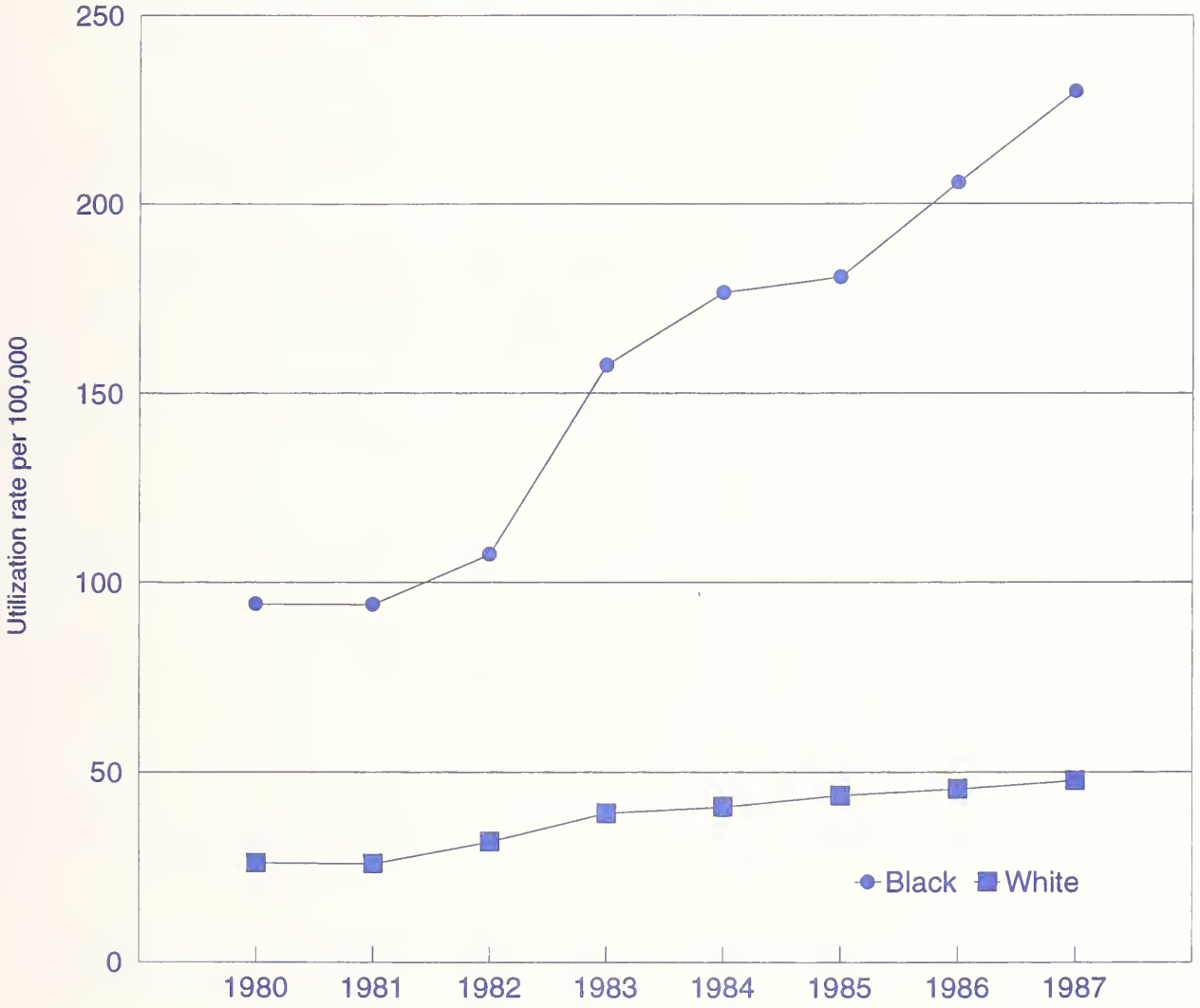
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	22.6 (15.3, 30.0)	21.2 (13.4, 29.1)	23.5 (13.7, 33.4)	30.8 (22.1, 39.5)	29.7 (20.4, 39.0)	39.0 (26.7, 51.3)	48.9 (34.9, 62.9)	49.0 (34.9, 63.2)	14.1 (10.7, 17.6)
White	6.0 (4.3, 7.8)	5.8 (4.4, 7.2)	5.7 (4.4, 7.0)	7.1 (5.6, 8.6)	7.2 (5.9, 8.5)	7.6 (6.3, 8.9)	7.5 (6.1, 8.9)	8.6 (7.2, 10.1)	5.8 (3.8, 7.8)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

47. Hemodialysis



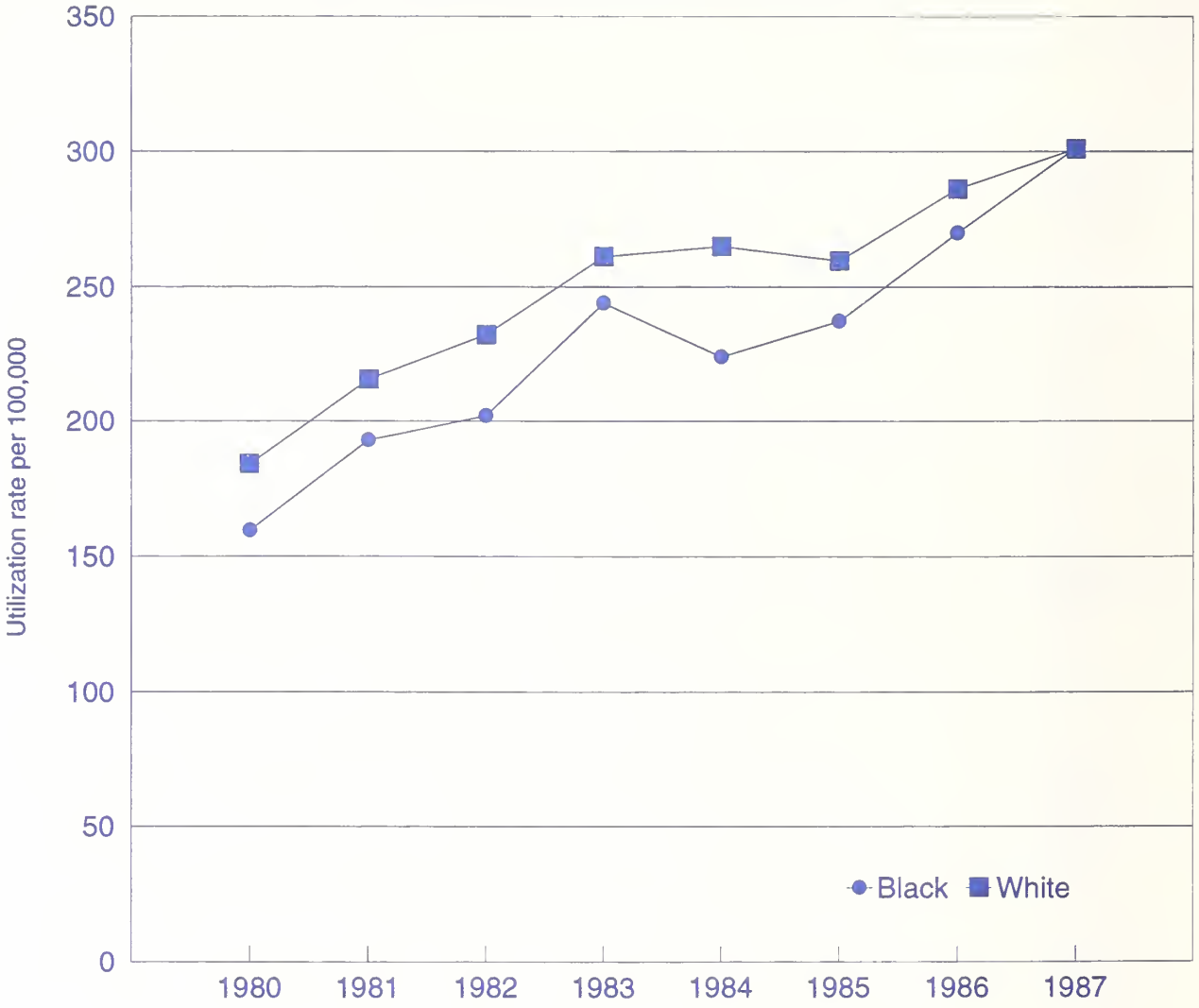
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	94.2 (59.7, 128.7)	94.1 (63.2, 125.0)	107.3 (70.4, 144.1)	157.4 (113.2, 201.6)	176.5 (123.4, 229.7)	180.6 (131.6, 229.7)	205.6 (146.1, 265.1)	229.8 (163.7, 295.8)	15.1 (11.8, 18.5)
White	26.2 (19.6, 32.7)	26.0 (20.0, 32.0)	31.8 (25.0, 38.7)	39.3 (31.1, 47.5)	40.9 (32.3, 49.6)	43.9 (35.5, 52.4)	45.6 (37.4, 53.7)	47.8 (40.3, 55.3)	10.0 (7.5, 12.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

48. Other cardiovascular procedures



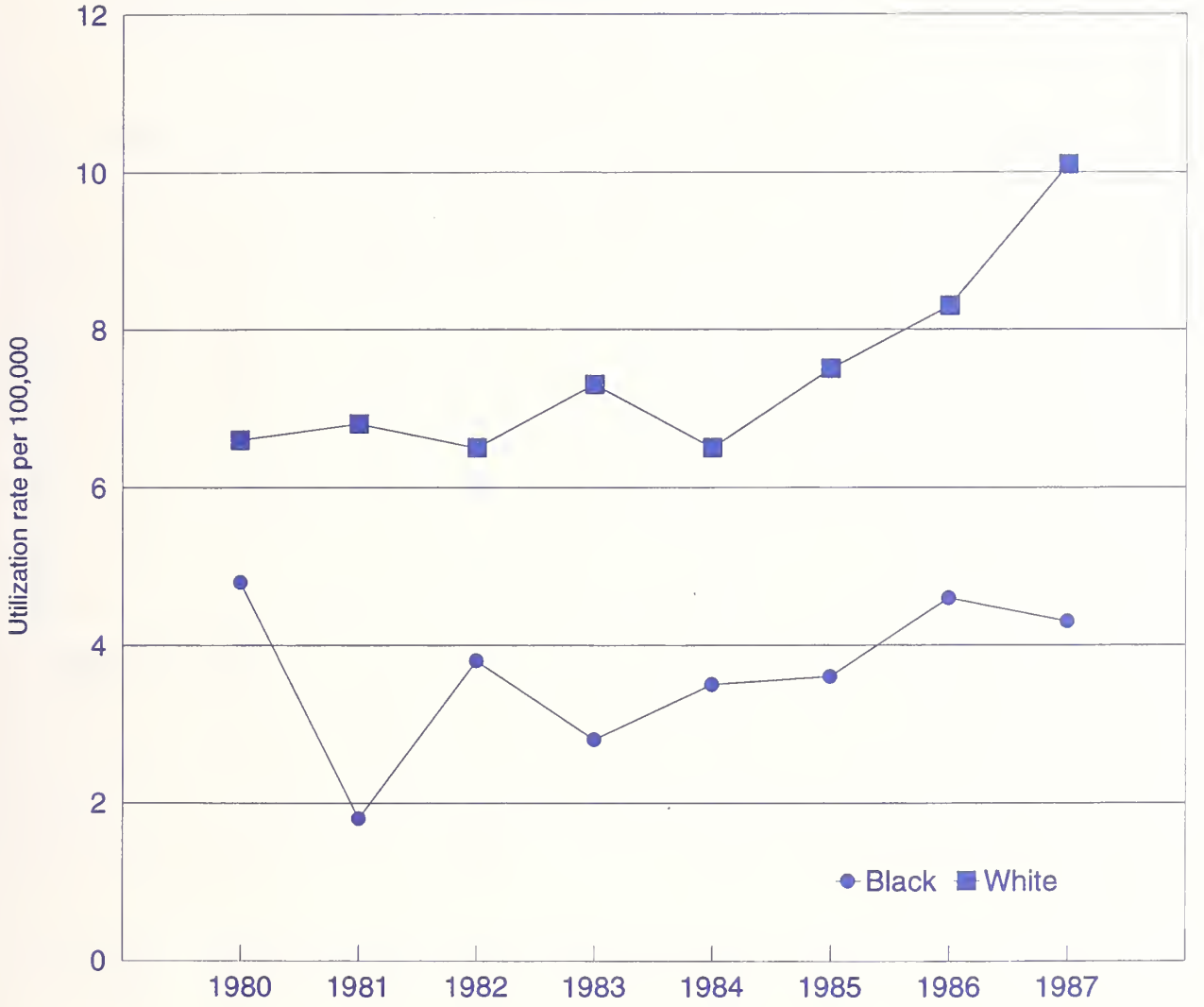
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	159.5 (116.9, 202.0)	192.8 (142.8, 242.7)	201.9 (153.2, 250.7)	244.0 (196.4, 291.6)	223.9 (176.2, 271.7)	237.3 (191.5, 283.1)	270.0 (206.9, 333.0)	301.2 (220.8, 381.7)	8.1 (5.9, 10.3)
White	184.0 (154.4, 213.6)	215.5 (182.3, 248.7)	232.2 (198.8, 265.6)	261.2 (223.6, 298.9)	265.0 (225.7, 304.3)	259.7 (218.9, 300.5)	286.2 (238.8, 333.6)	300.9 (249.0, 352.8)	6.4 (4.6, 8.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

49. Other open heart procedures



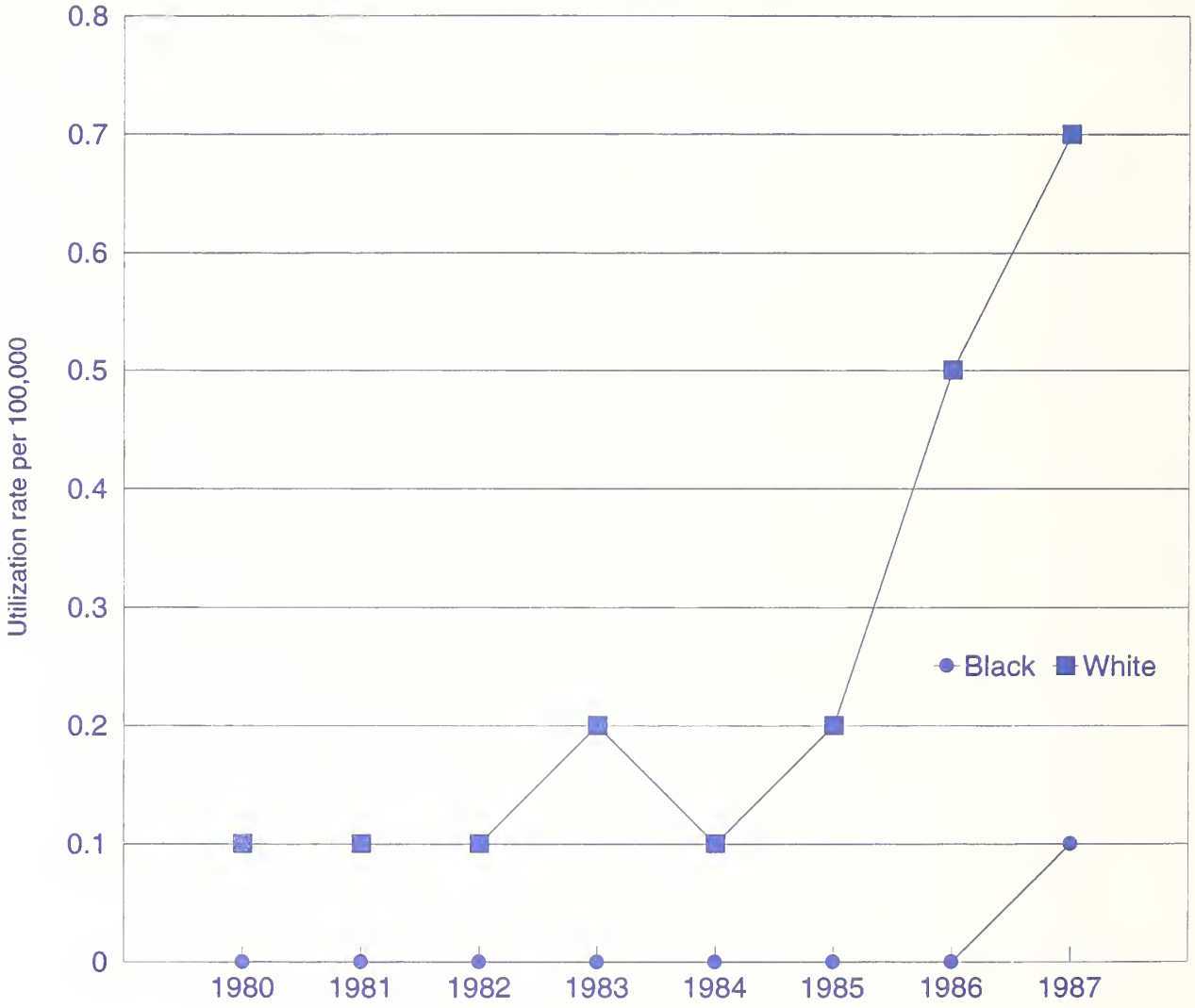
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	4.8 (2.3, 7.4)	1.8 (0.6, 3.1)	3.8 (1.1, 6.4)	2.8 (1.3, 4.3)	3.5 (1.4, 5.5)	3.6 (1.6, 5.6)	4.6 (3.0, 6.3)	4.3 (2.6, 6.0)	4.7 (−5.0, 15.3)
White	6.6 (4.0, 9.2)	6.8 (4.5, 9.1)	6.5 (3.7, 9.4)	7.3 (4.6, 10.0)	6.5 (4.2, 8.8)	7.5 (5.2, 9.7)	8.3 (5.7, 11.0)	10.1 (7.2, 13.0)	5.2 (2.2, 8.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

50. Bone marrow transplant



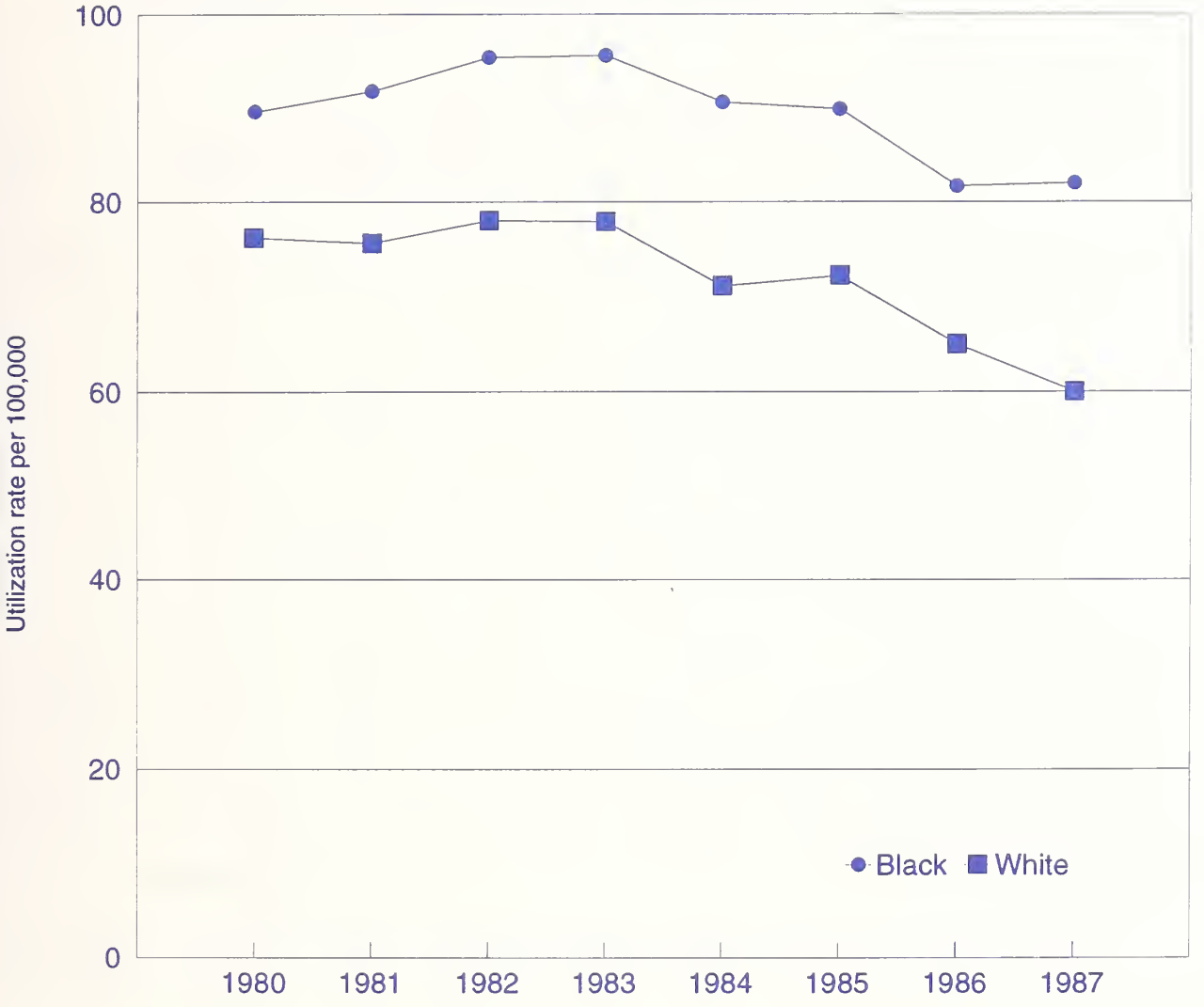
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	0 (—, —)	0 (—, —)	0 (—, —)	0 (—, —)	0 (—, —)	0 (—, —)	0 (—, —)	0.1 (0.0, 0.4)	— (—, —)
White	0.1 (0.0, 0.2)	0.1 (0.0, 0.2)	0.1 (0.0, 0.2)	0.2 (0.0, 0.4)	0.1 (0.0, 0.3)	0.2 (0.0, 0.4)	0.5 (0.1, 1.0)	0.7 (0.1, 1.2)	32.7 (16.7, 50.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

51. Bone marrow biopsy



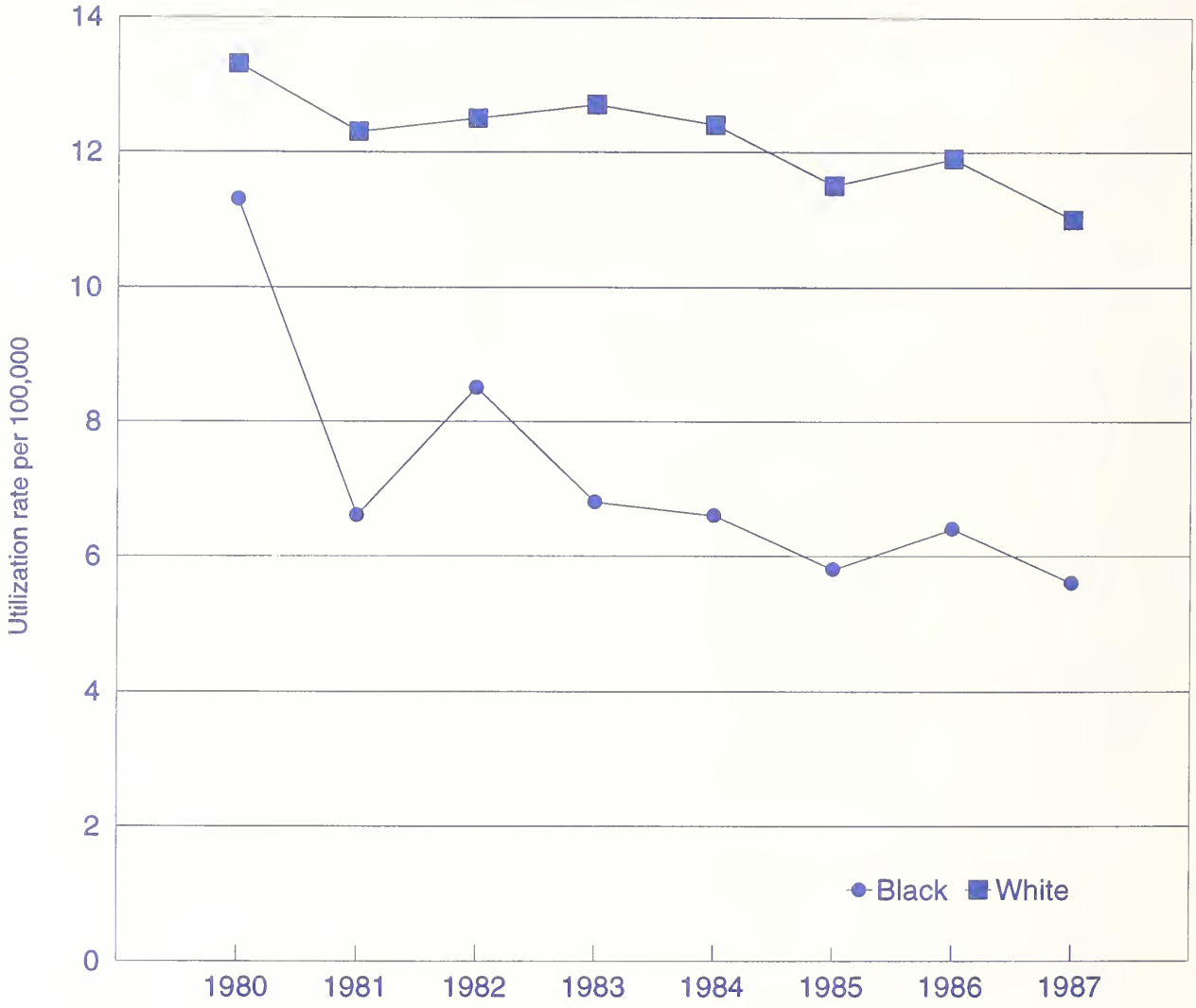
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	89.6 (69.6, 109.5)	91.8 (74.5, 109.0)	95.4 (76.5, 114.3)	95.6 (77.9, 113.3)	90.6 (73.1, 108.2)	89.9 (72.7, 107.2)	81.7 (64.2, 99.1)	82.0 (63.7, 100.4)	–1.7 (–3.1, –0.3)
White	76.2 (68.4, 84.0)	75.6 (68.5, 82.7)	78.0 (70.4, 85.6)	77.9 (71.1, 84.8)	71.1 (64.8, 77.4)	72.2 (64.4, 80.1)	65.0 (58.1, 71.9)	60.0 (53.1, 67.0)	–3.2 (–4.8, –1.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

52. Splenectomy



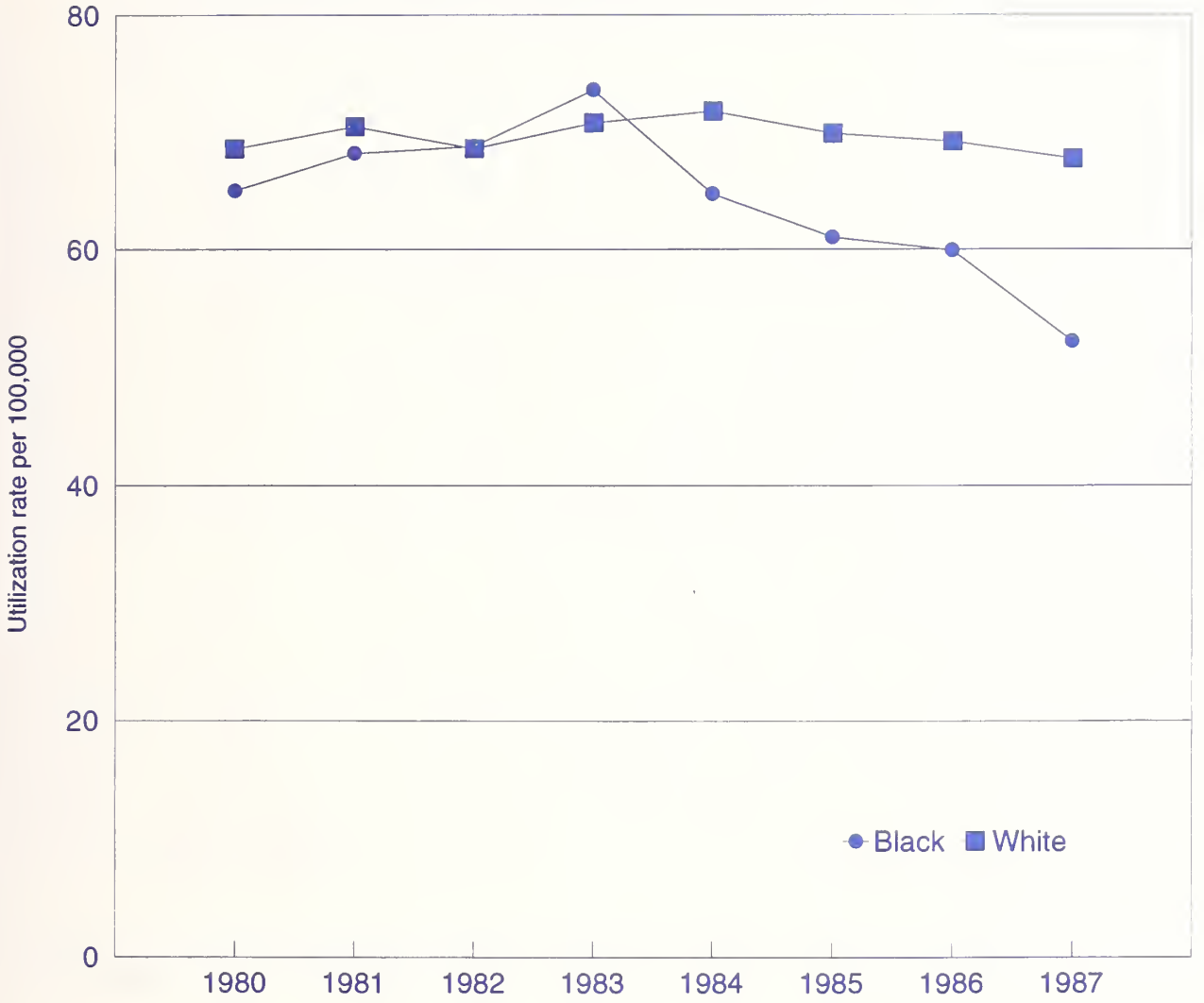
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	11.3 (8.0, 14.6)	6.6 (4.0, 9.2)	8.5 (5.7, 11.4)	6.8 (4.2, 9.4)	6.6 (4.4, 8.7)	5.8 (3.7, 7.9)	6.4 (4.2, 8.6)	5.6 (3.5, 7.7)	−7.3 (−11.4, −3.0)
White	13.3 (11.9, 14.7)	12.3 (11.0, 13.7)	12.5 (11.2, 13.8)	12.7 (11.3, 14.0)	12.4 (11.0, 13.8)	11.5 (10.2, 12.7)	11.9 (10.4, 13.4)	11.0 (9.8, 12.2)	−2.1 (−3.0, −1.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

53. Other procedures, hemic and lymphatic system



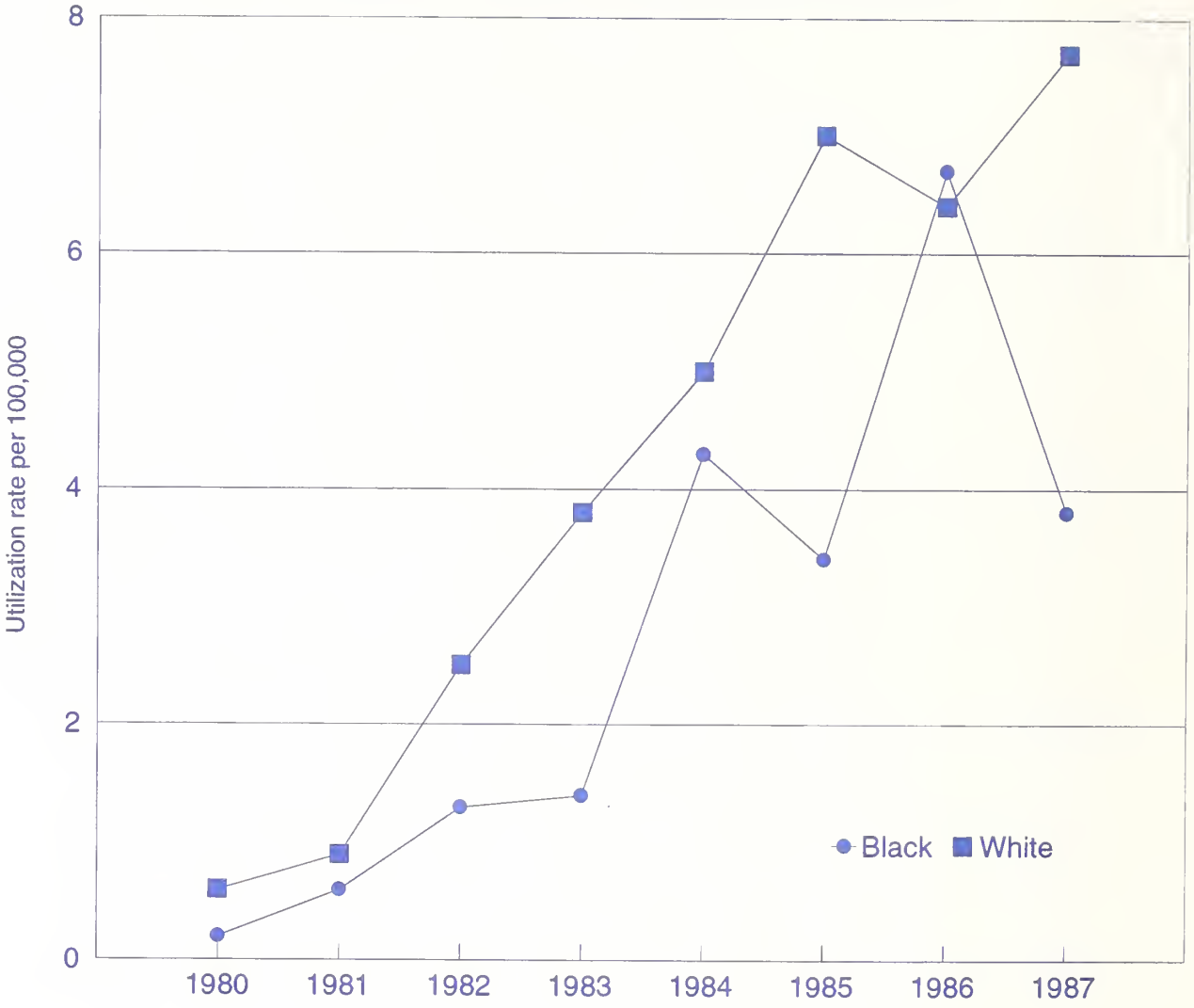
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	65.0 (52.3, 77.8)	68.2 (54.6, 81.7)	68.8 (55.0, 82.6)	73.6 (54.7, 92.6)	64.7 (52.5, 76.9)	61.0 (49.0, 72.9)	59.9 (47.1, 72.8)	52.2 (40.8, 63.7)	–3.1 (–5.3, –0.9)
White	68.6 (62.6, 74.6)	70.5 (65.2, 75.8)	68.6 (63.1, 74.2)	70.8 (65.2, 76.4)	71.8 (65.9, 77.6)	69.9 (63.6, 76.1)	69.2 (63.3, 75.2)	67.7 (61.9, 73.5)	–0.1 (–0.8, 0.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

54. Injection or ligation of esophageal varices



Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	0.2 (0.0, 0.6)	0.6 (0.0, 1.2)	1.3 (0.3, 2.3)	1.4 (0.0, 2.9)	4.3 (0.6, 8.0)	3.4 (1.7, 5.1)	6.7 (4.2, 9.2)	3.8 (1.9, 5.6)	54.4 (31.7, 81.0)
White	0.6 (0.0, 1.2)	0.9 (0.3, 1.5)	2.5 (1.4, 3.6)	3.8 (2.7, 5.0)	5.0 (3.9, 6.2)	7.0 (5.6, 8.4)	6.4 (5.0, 7.7)	7.7 (6.4, 8.9)	44.5 (29.2, 61.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

55. Esophageal dilation

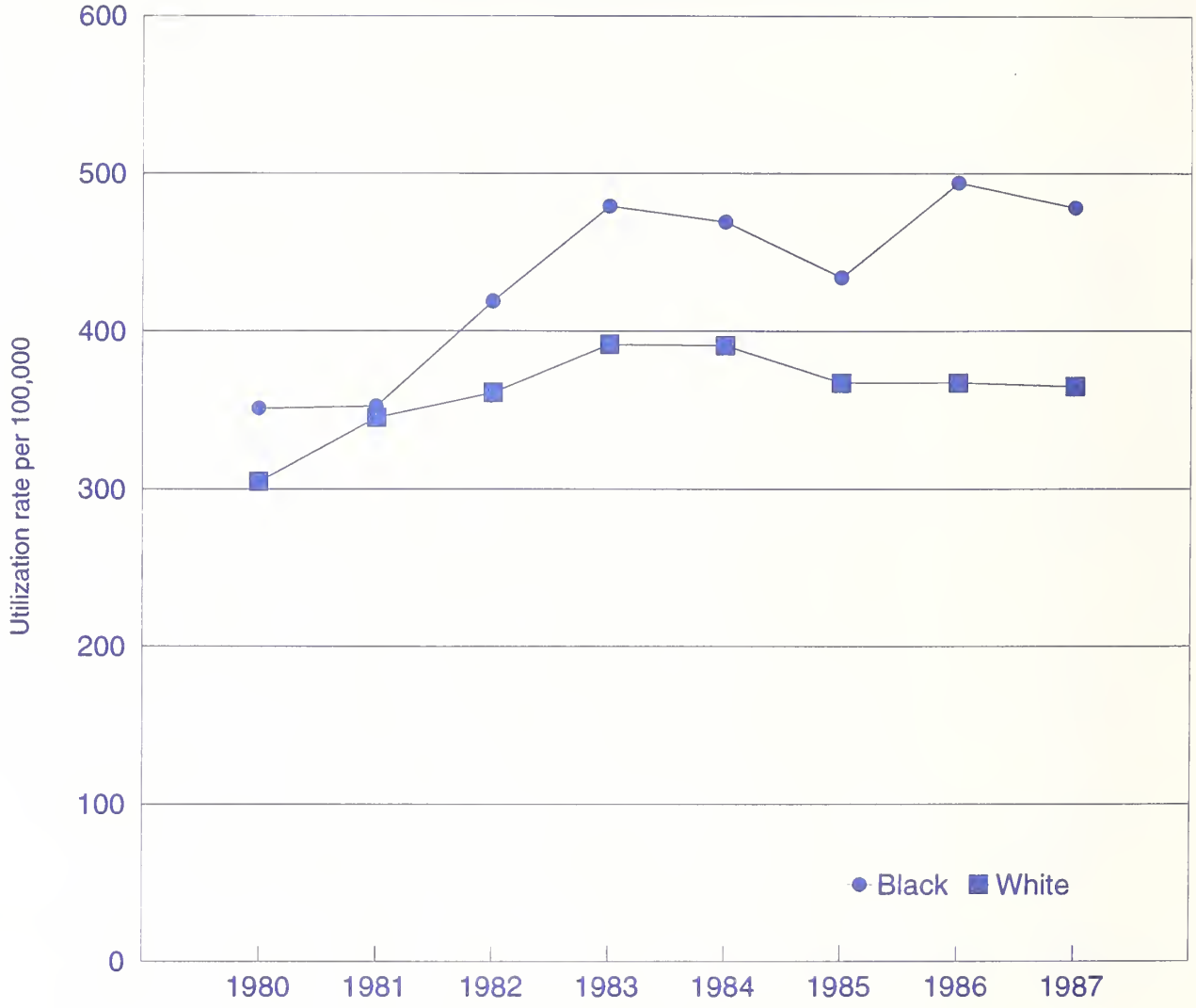
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	7.7 (5.5, 9.9)	11.3 (7.8, 14.8)	15.9 (9.8, 21.9)	13.1 (9.1, 17.1)	14.2 (9.2, 19.3)	12.6 (7.4, 17.8)	16.1 (10.4, 21.7)	10.2 (5.7, 14.7)	3.8 (–3.7, 11.9)
White	14.1 (12.0, 16.1)	15.9 (13.8, 18.1)	15.1 (12.9, 17.3)	16.6 (14.6, 18.6)	17.0 (14.5, 19.5)	15.5 (13.5, 17.5)	13.2 (11.3, 15.1)	11.0 (9.4, 12.5)	–3.0 (–6.9, 0.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

56. Upper gastrointestinal endoscopy, biopsy



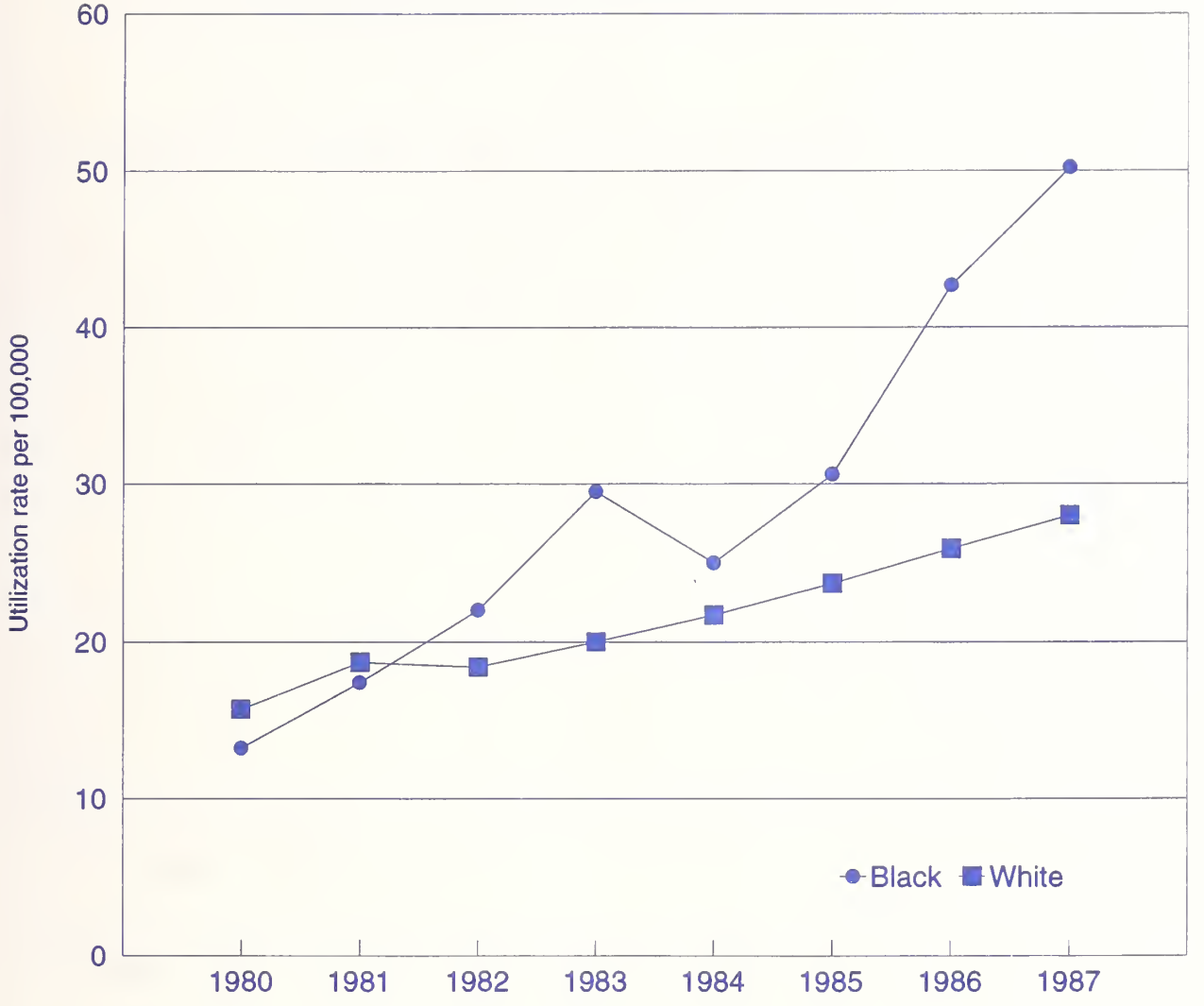
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	351.1 (286.2, 415.9)	352.4 (290.6, 414.3)	418.8 (344.9, 492.7)	479.0 (392.6, 565.4)	469.0 (385.9, 552.0)	433.7 (356.5, 510.9)	494.0 (401.0, 587.0)	477.9 (388.8, 566.9)	4.8 (2.3, 7.4)
White	304.6 (277.0, 332.3)	345.2 (314.5, 375.9)	361.0 (328.8, 393.2)	391.6 (360.1, 423.2)	390.9 (360.1, 421.8)	367.3 (337.0, 397.6)	367.3 (336.0, 398.6)	364.7 (332.9, 396.4)	1.9 (–0.2, 4.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

57. Gastrostomy, temporary and permanent



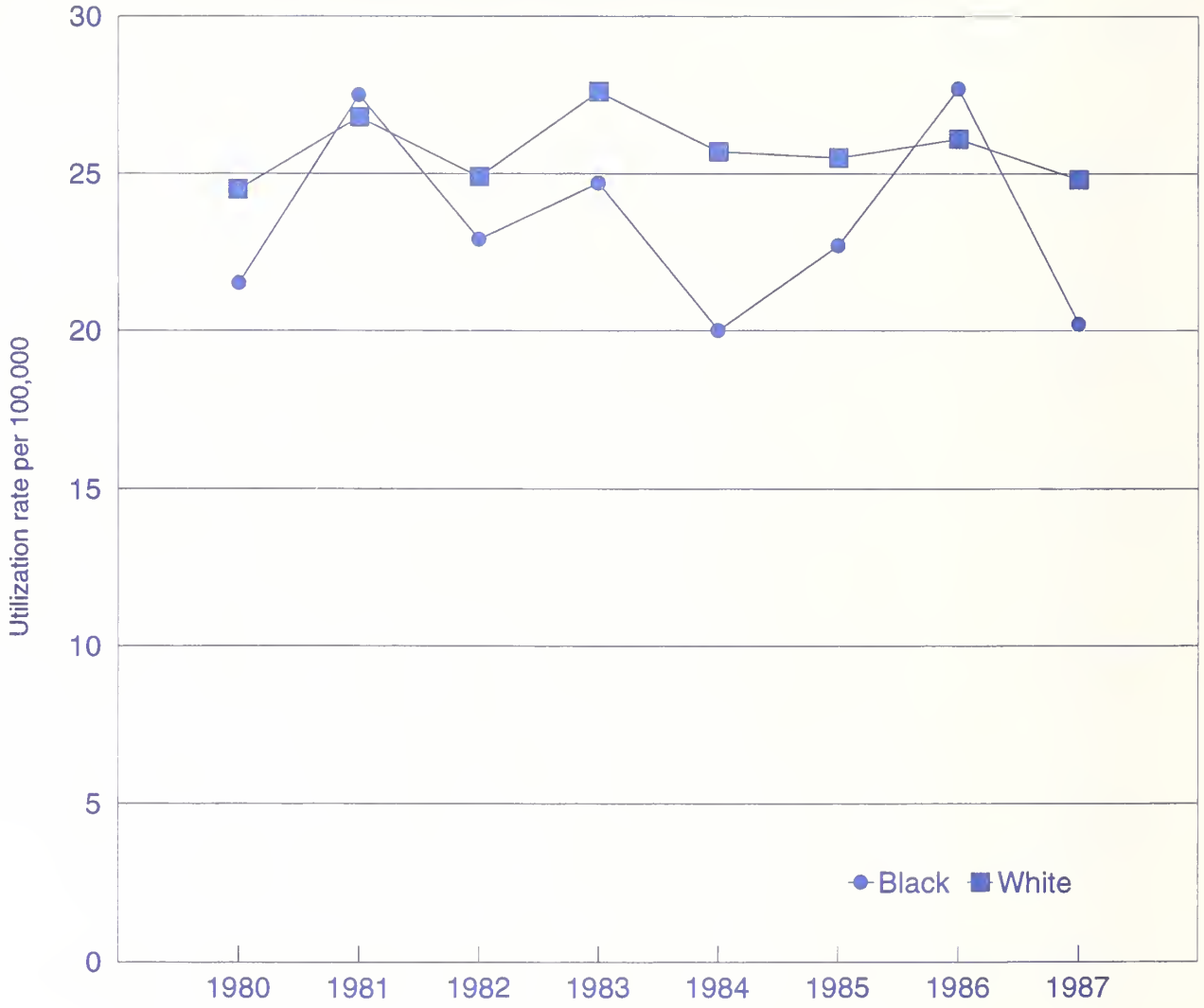
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	13.2 (9.7, 16.6)	17.4 (12.9, 21.8)	22.0 (15.6, 28.4)	29.5 (21.8, 37.2)	25.0 (18.3, 31.8)	30.6 (22.1, 39.1)	42.7 (31.4, 54.1)	50.2 (33.4, 67.0)	19.1 (14.8, 23.6)
White	15.7 (13.2, 18.2)	18.7 (16.0, 21.4)	18.4 (15.7, 21.0)	20.0 (17.2, 22.7)	21.7 (19.1, 24.3)	23.7 (20.6, 26.7)	25.9 (23.2, 28.6)	28.0 (25.0, 31.0)	8.1 (7.0, 9.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

58. Colostomy, temporary and permanent



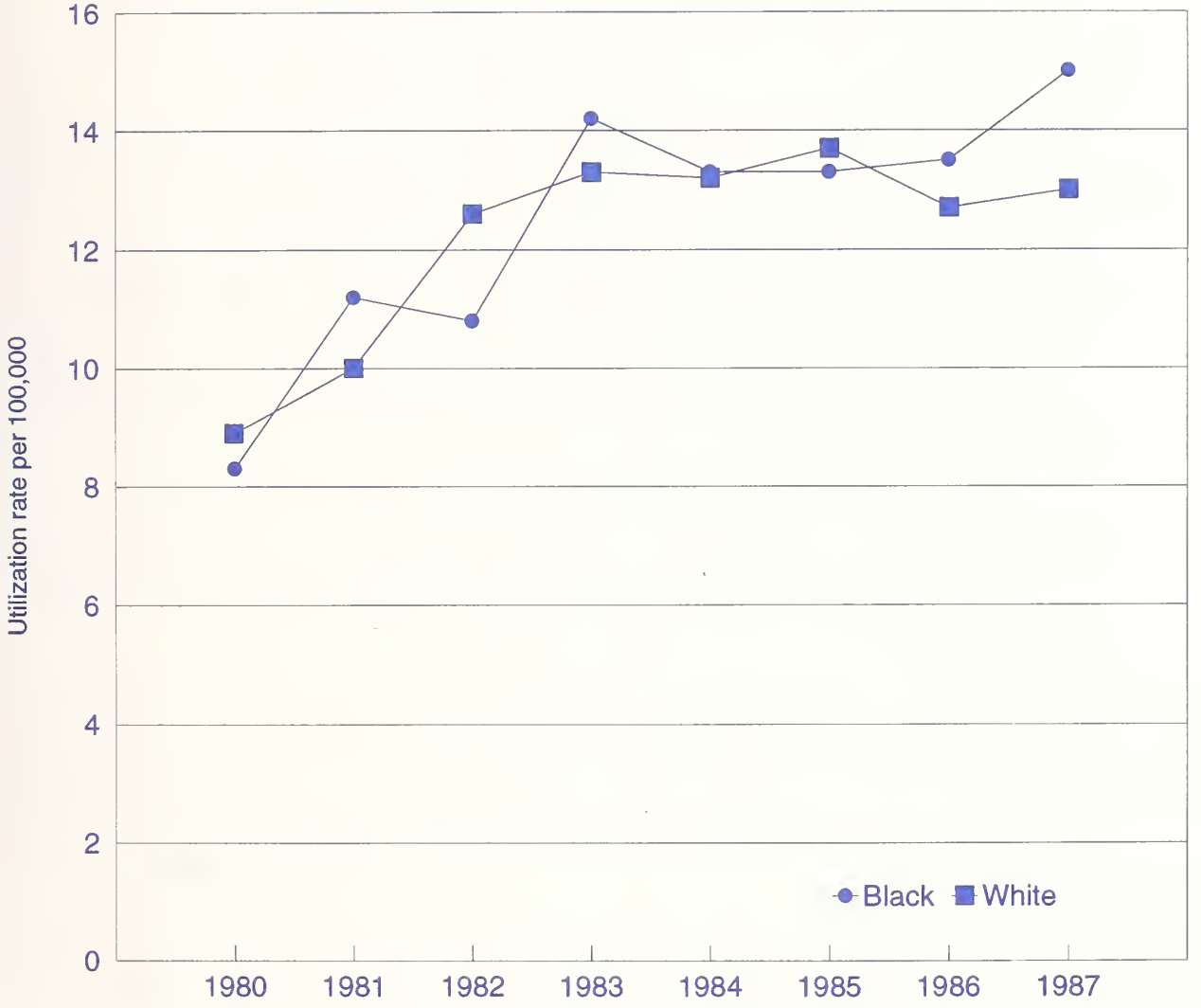
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	21.5 (15.1, 27.9)	27.5 (21.8, 33.2)	22.9 (17.0, 28.8)	24.7 (18.8, 30.6)	20.0 (14.5, 25.5)	22.7 (17.0, 28.4)	27.7 (19.8, 35.6)	20.2 (15.3, 25.1)	–0.7 (–4.7, 3.4)
White	24.5 (22.5, 26.5)	26.8 (24.7, 28.8)	24.9 (22.9, 26.8)	27.6 (25.7, 29.6)	25.7 (23.5, 27.8)	25.5 (23.4, 27.7)	26.1 (24.0, 28.3)	24.8 (22.3, 27.4)	–0.0 (–1.4, 1.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

59. Ileostomy and other enterostomy



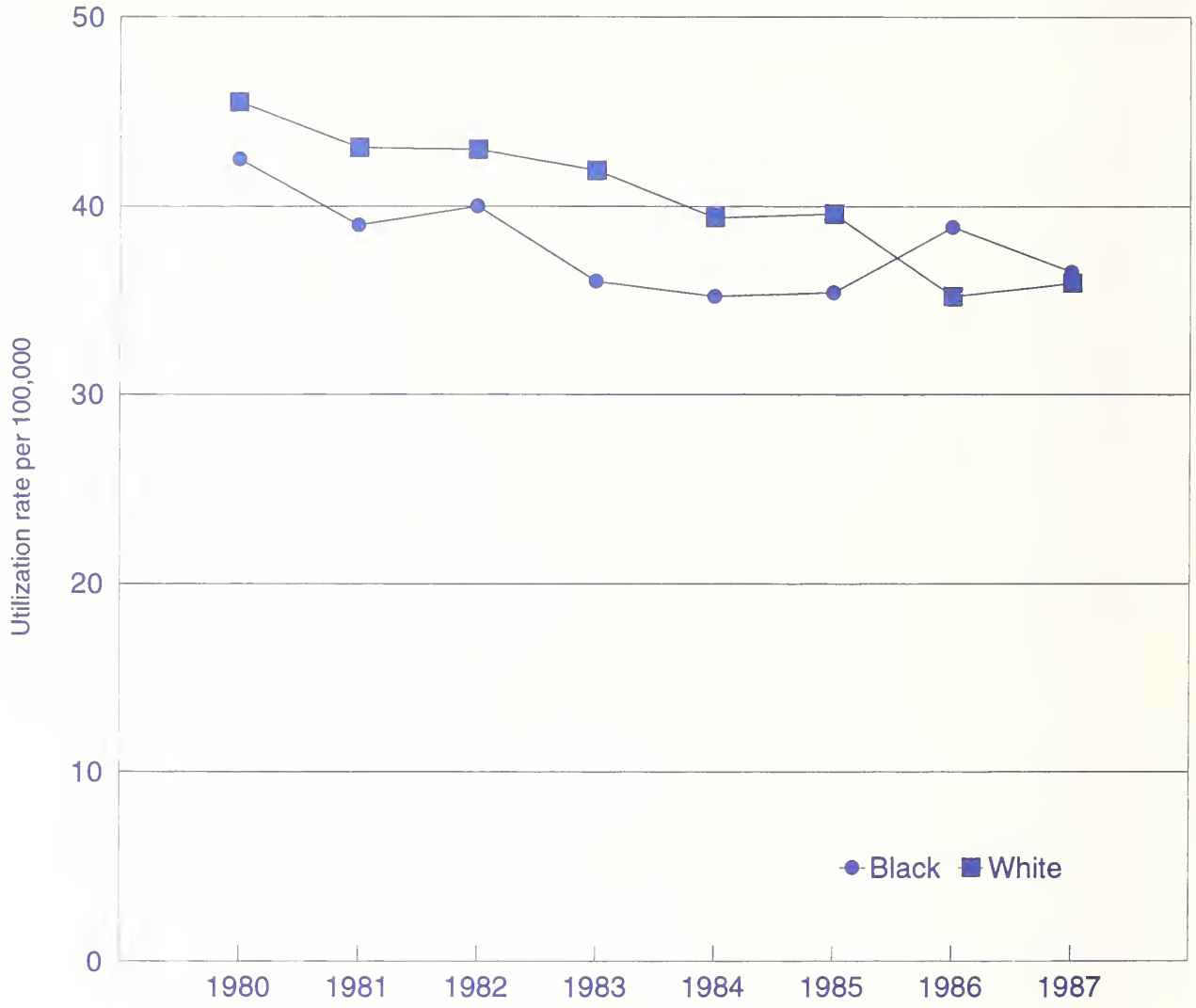
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	8.3 (4.9, 11.7)	11.2 (7.8, 14.7)	10.8 (7.7, 13.9)	14.2 (9.7, 18.6)	13.3 (8.9, 17.8)	13.3 (9.8, 16.8)	13.5 (8.7, 18.3)	15.0 (10.1, 19.9)	6.9 (3.4, 10.4)
White	8.9 (7.6, 10.2)	10.0 (8.8, 11.2)	12.6 (11.0, 14.2)	13.3 (11.4, 15.2)	13.2 (11.3, 15.0)	13.7 (11.8, 15.6)	12.7 (11.1, 14.4)	13.0 (11.3, 14.6)	5.0 (1.5, 8.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

60. Surgical treatment for peptic ulcer



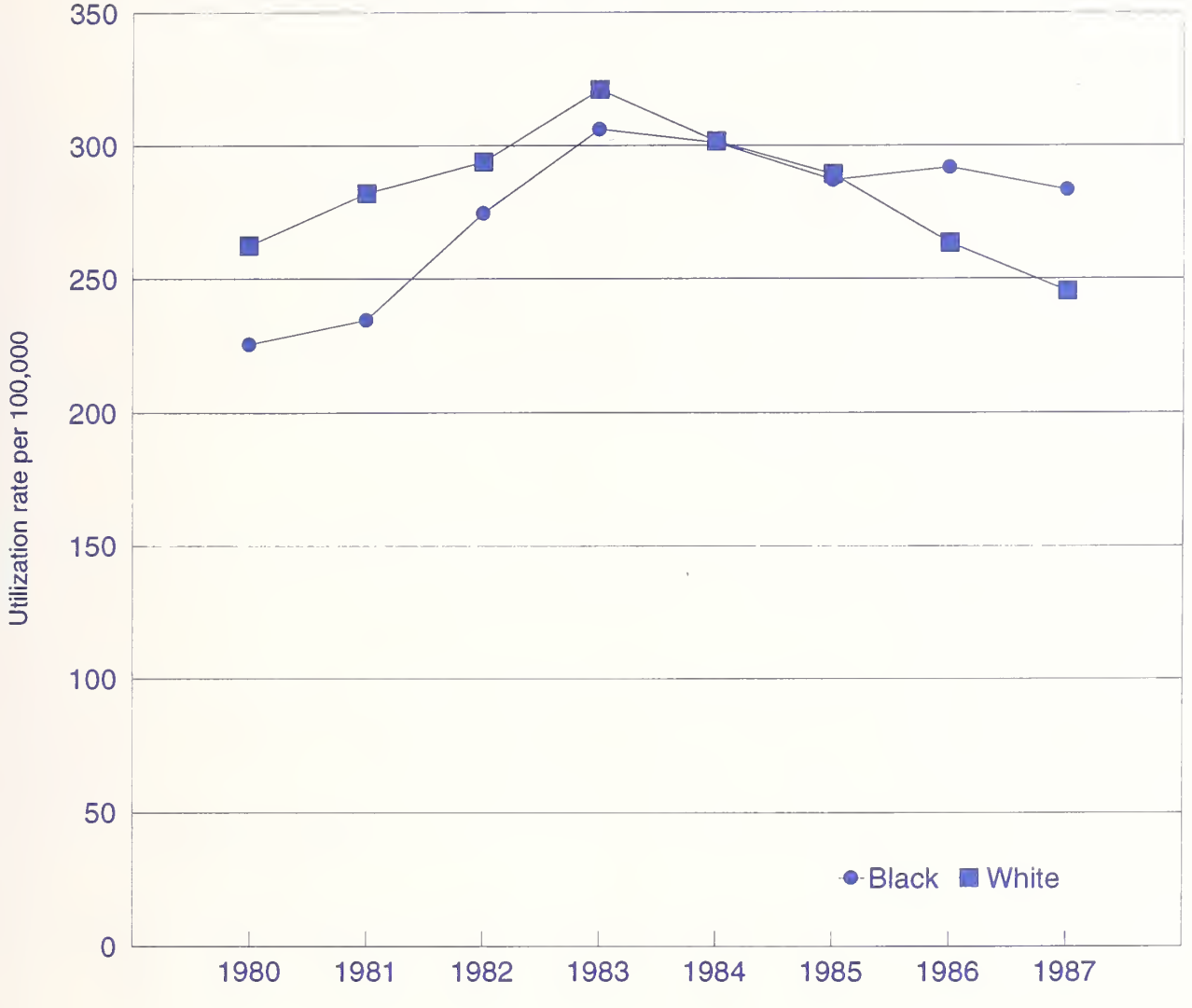
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	42.5 (32.6, 52.5)	39.0 (29.7, 48.2)	40.0 (31.9, 48.0)	36.0 (26.7, 45.3)	35.2 (27.7, 42.8)	35.4 (27.5, 43.4)	38.9 (29.6, 48.2)	36.5 (26.4, 46.5)	−1.7 (−3.4, −0.0)
White	45.5 (41.0, 49.9)	43.1 (39.1, 47.1)	43.0 (39.4, 46.6)	41.9 (38.3, 45.5)	39.4 (36.2, 42.6)	39.6 (35.5, 43.7)	35.2 (31.9, 38.6)	35.9 (32.3, 39.5)	−3.5 (−4.3, −2.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

61. Colonoscopy and biopsy



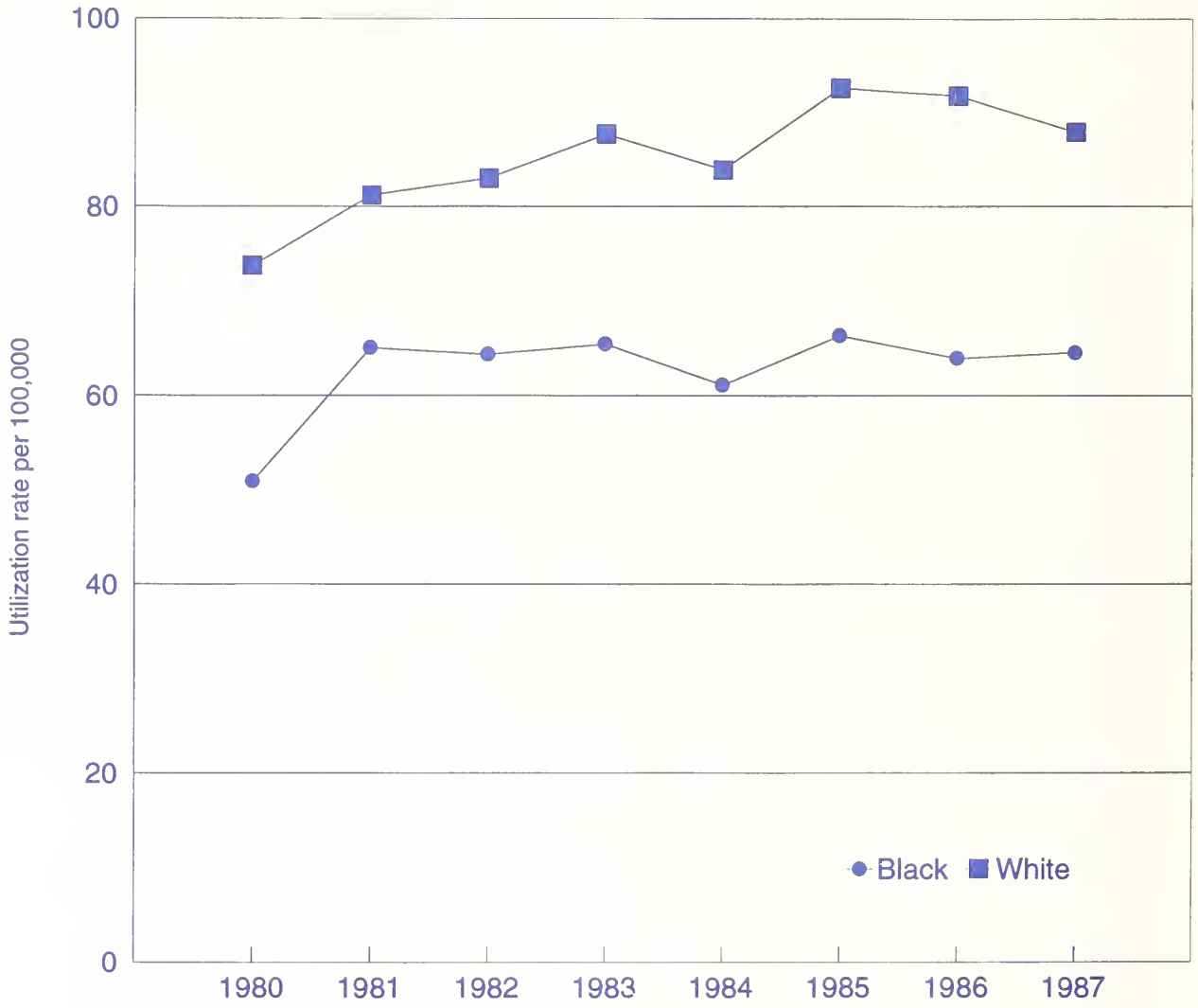
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	225.5 (179.3, 271.8)	234.5 (193.8, 275.3)	274.5 (222.8, 326.3)	306.1 (248.1, 364.0)	301.0 (246.3, 355.8)	287.0 (235.0, 339.0)	291.8 (230.3, 353.4)	283.3 (231.3, 335.4)	3.4 (0.8, 6.1)
White	262.4 (236.4, 288.3)	282.0 (255.8, 308.3)	293.8 (269.3, 318.3)	321.0 (292.9, 349.1)	301.5 (275.2, 327.7)	289.2 (262.8, 315.6)	263.3 (238.0, 288.6)	245.2 (218.1, 272.3)	−1.1 (−3.7, 1.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

62. Colon resection



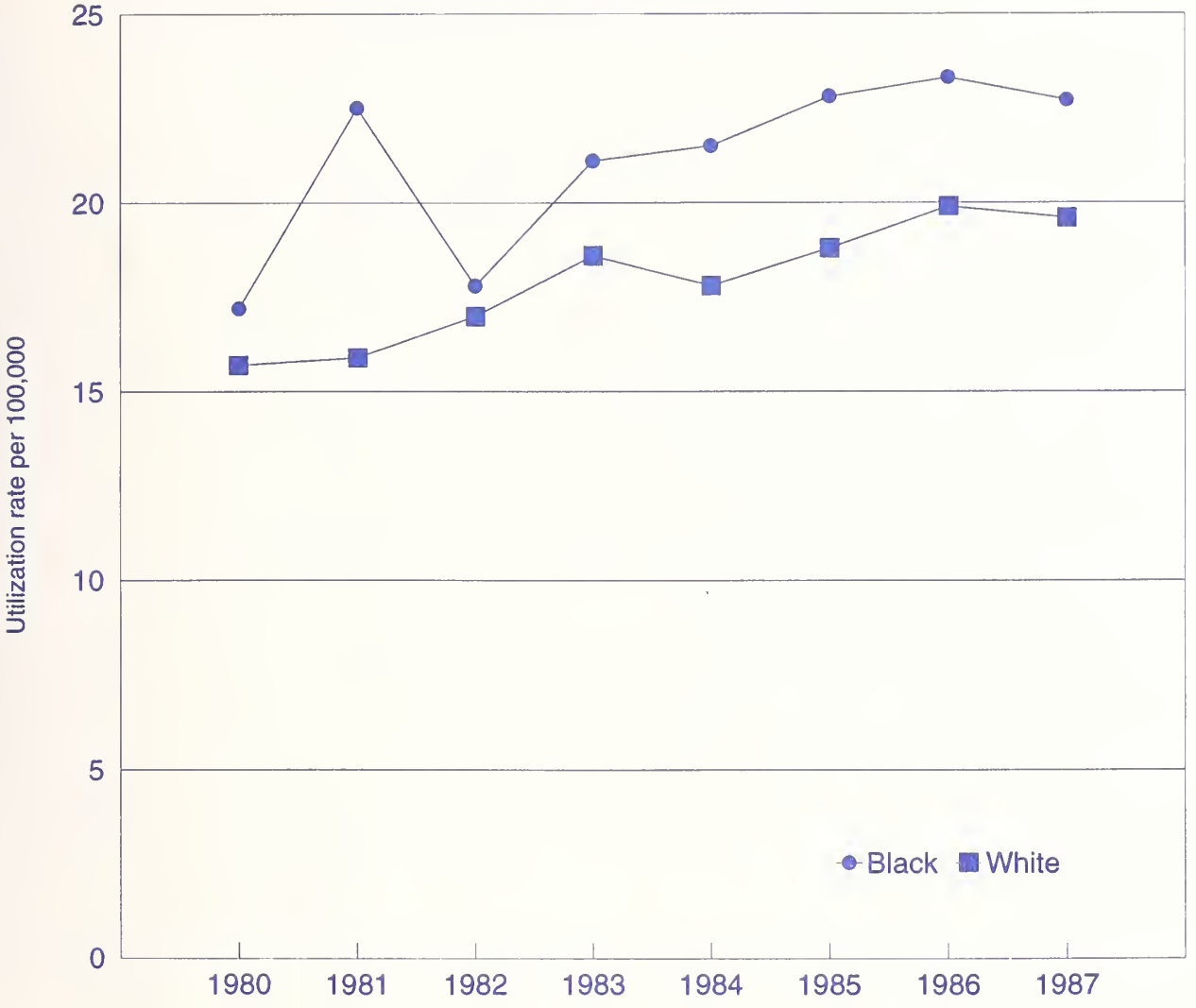
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	50.9 (40.0, 61.8)	65.0 (52.2, 77.7)	64.3 (53.2, 75.4)	65.4 (53.5, 77.4)	61.1 (49.4, 72.9)	66.3 (54.9, 77.8)	63.9 (49.1, 78.8)	64.5 (51.9, 77.1)	1.9 (–0.5, 4.4)
White	73.7 (68.8, 78.7)	81.2 (75.7, 86.8)	83.0 (77.2, 88.8)	87.7 (82.0, 93.4)	83.9 (78.5, 89.2)	92.6 (86.0, 99.3)	91.8 (85.1, 98.6)	87.9 (80.9, 95.0)	2.6 (1.2, 3.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

63. Small bowel resection



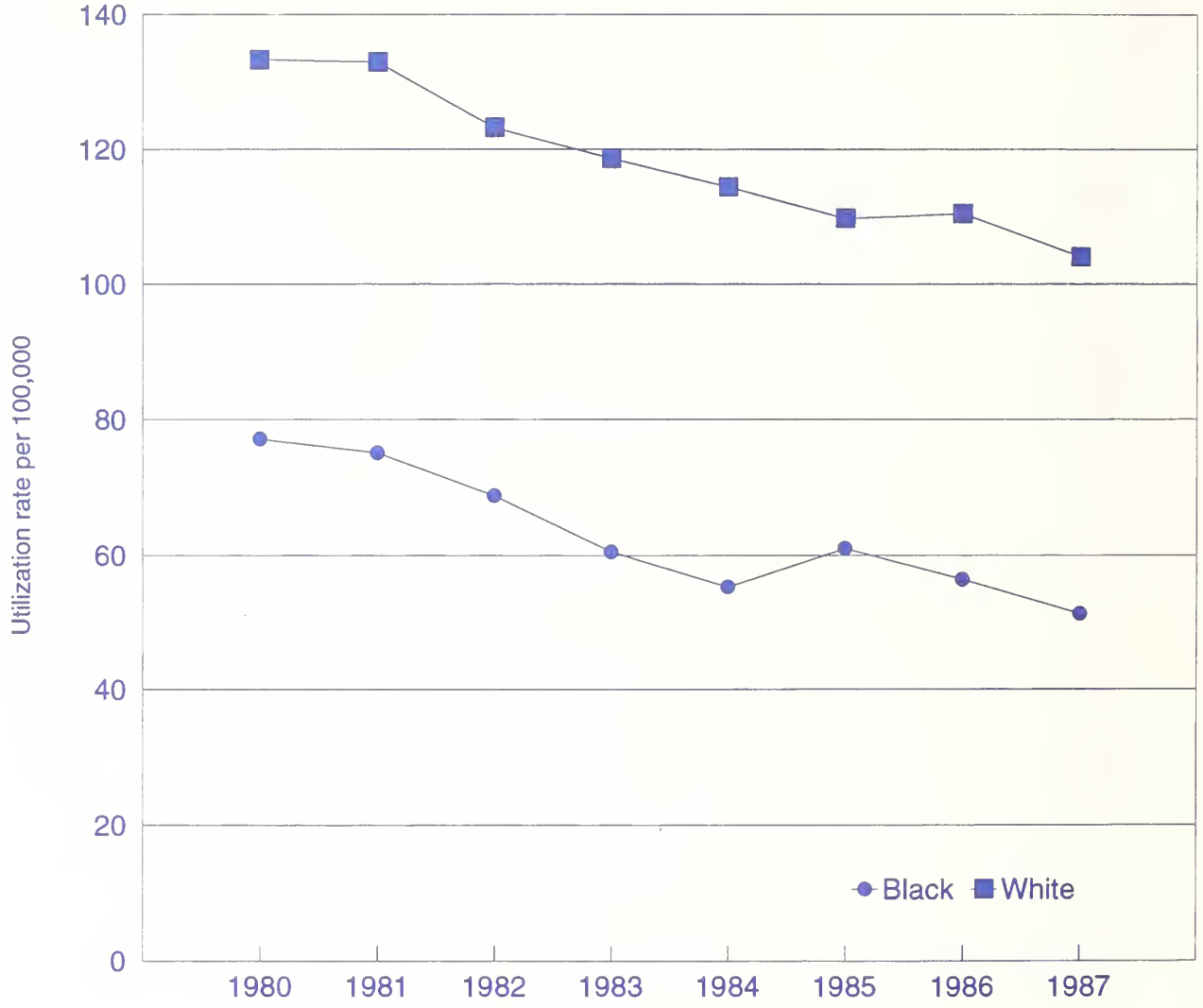
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	17.2 (12.5, 21.8)	22.5 (17.4, 27.5)	17.8 (13.3, 22.2)	21.1 (16.5, 25.8)	21.5 (15.6, 27.3)	22.8 (17.7, 27.9)	23.3 (17.8, 28.7)	22.7 (16.5, 29.0)	3.5 (0.8, 6.3)
White	15.7 (14.1, 17.2)	15.9 (14.4, 17.5)	17.0 (15.4, 18.6)	18.6 (16.9, 20.4)	17.8 (16.0, 19.5)	18.8 (17.1, 20.6)	19.9 (18.1, 21.8)	19.6 (17.7, 21.6)	3.6 (2.6, 4.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

64. Appendectomy



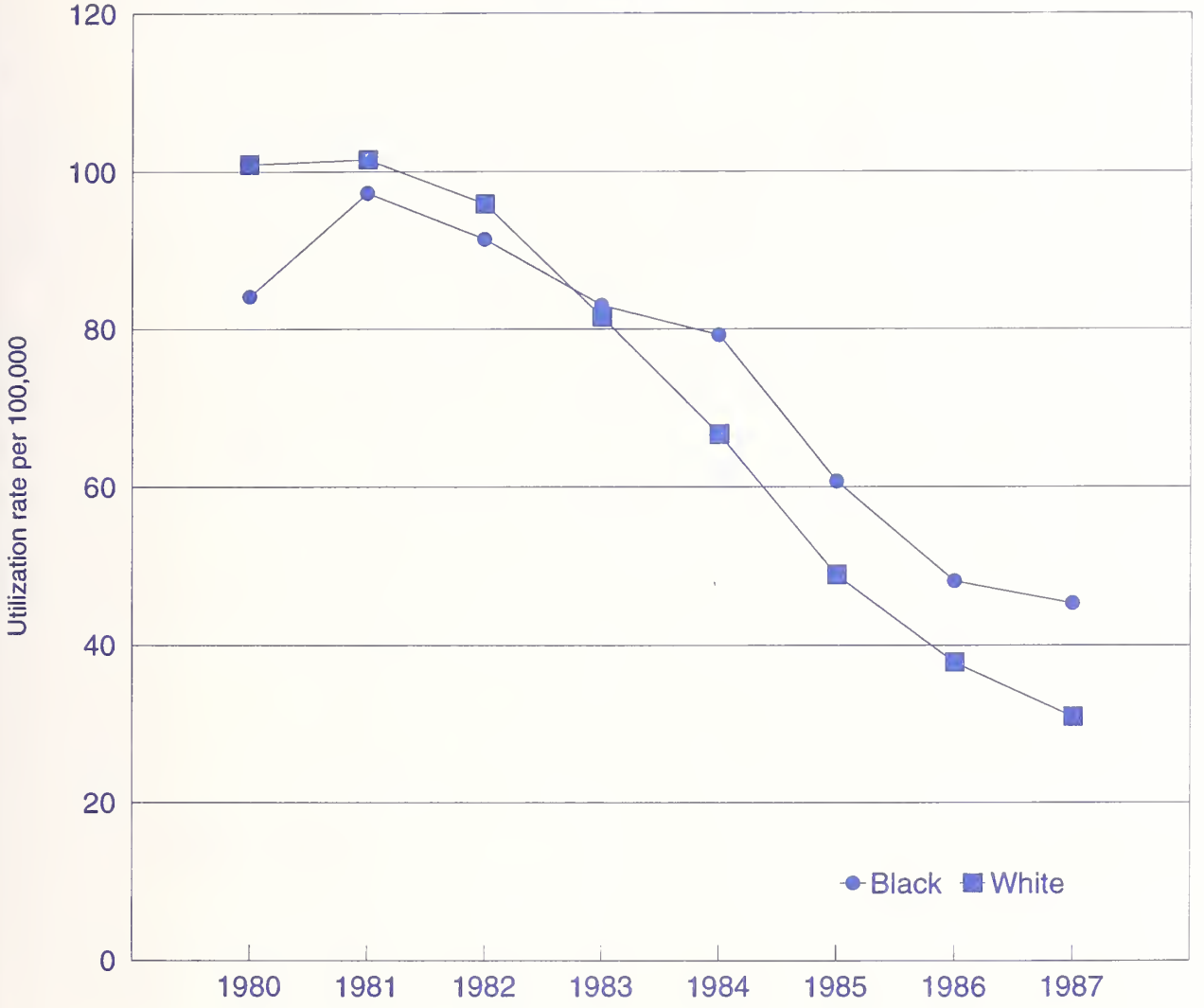
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	77.1	75.1	68.8	60.5	55.3	61.0	56.4	51.3	−5.5
	(63.3,	(64.3,	(57.7,	(51.4,	(46.9,	(51.5,	(45.6,	(41.5,	(−7.1,
	91.0)	85.9)	80.0)	69.6)	63.8)	70.4)	67.3)	61.0)	−3.8)
White	133.3	132.9	123.2	118.6	114.4	109.7	110.4	104.0	−3.6
	(124.8,	(124.6,	(115.5,	(111.6,	(107.5,	(102.4,	(103.2,	(96.7,	(−4.1,
	141.8)	141.1)	131.0)	125.6)	121.3)	117.1)	117.6)	111.2)	−3.0)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

65. Proctoscopy and biopsy



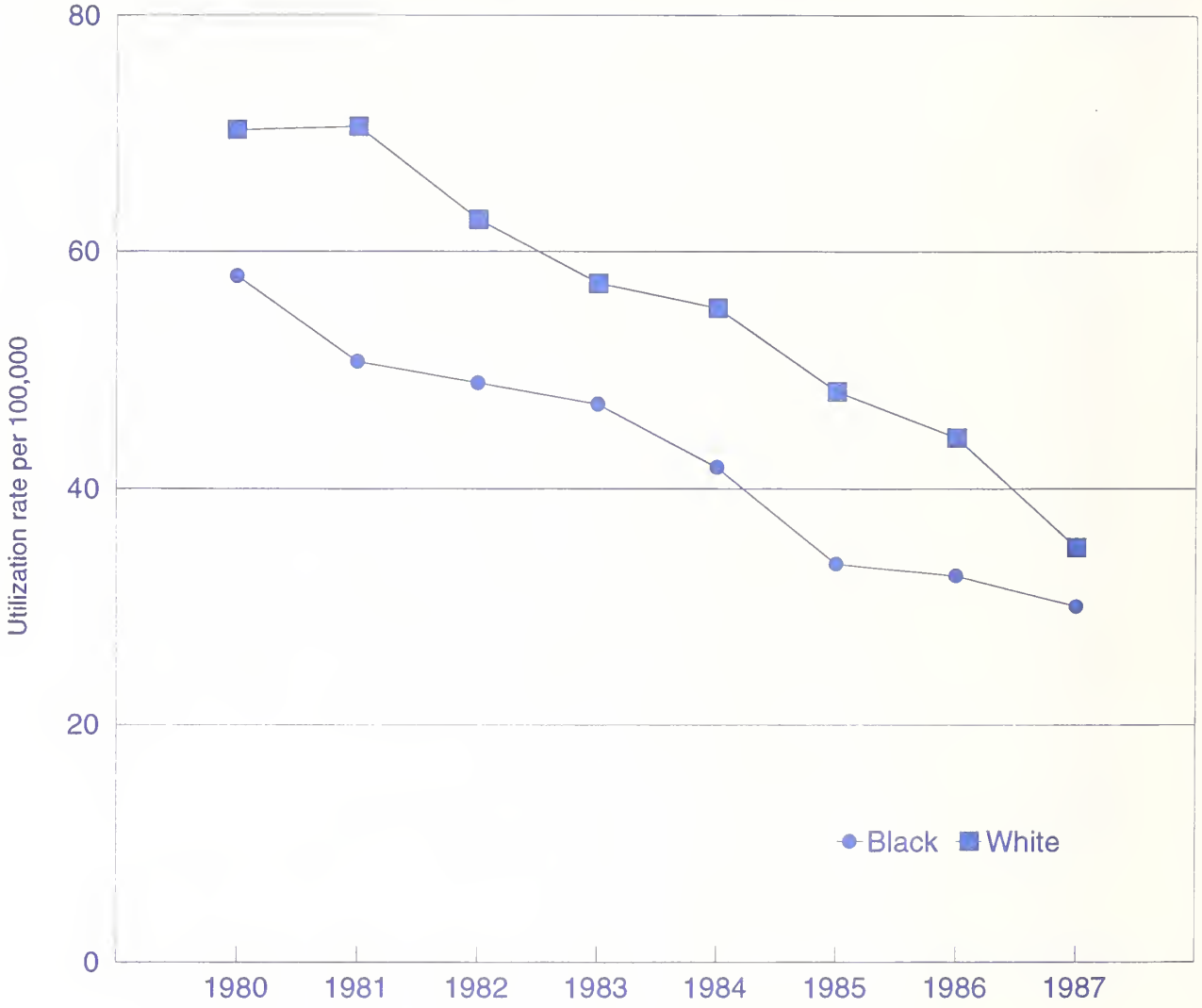
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	84.1 (61.1, 107.0)	97.3 (70.4, 124.3)	91.4 (64.6, 118.2)	83.0 (60.5, 105.6)	79.2 (56.6, 101.8)	60.7 (39.2, 82.2)	48.1 (31.9, 64.3)	45.3 (30.3, 60.4)	−10.3 (−13.9, −6.5)
White	100.9 (86.6, 115.3)	101.5 (87.8, 115.3)	95.9 (82.6, 109.3)	81.5 (72.4, 90.7)	66.6 (58.7, 74.5)	48.9 (43.3, 54.5)	37.8 (32.9, 42.7)	30.9 (26.3, 35.4)	−16.8 (−20.0, −13.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

66. Hemorrhoid procedures



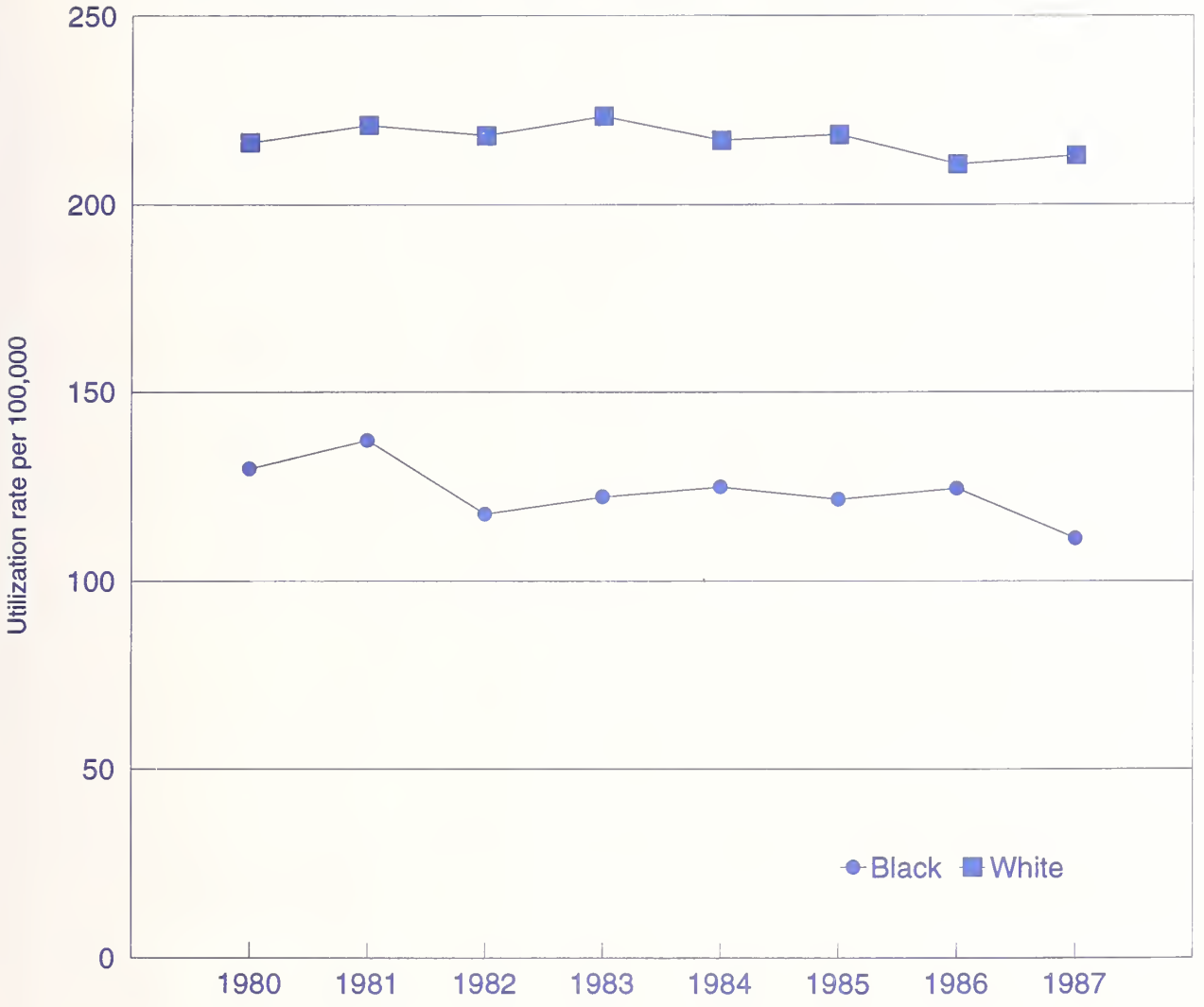
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	57.9 (44.0, 71.8)	50.7 (40.1, 61.2)	48.9 (39.4, 58.4)	47.1 (38.4, 55.9)	41.8 (34.2, 49.4)	33.6 (26.7, 40.5)	32.6 (25.2, 40.1)	30.0 (23.4, 36.6)	–9.1 (–10.5, –7.7)
White	70.3 (63.7, 76.8)	70.6 (63.5, 77.6)	62.7 (56.1, 69.2)	57.3 (52.4, 62.3)	55.2 (50.4, 60.1)	48.2 (43.3, 53.0)	44.3 (39.6, 49.0)	35.0 (31.0, 39.0)	–9.1 (–10.8, –7.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

67. Cholecystectomy and common duct exploration



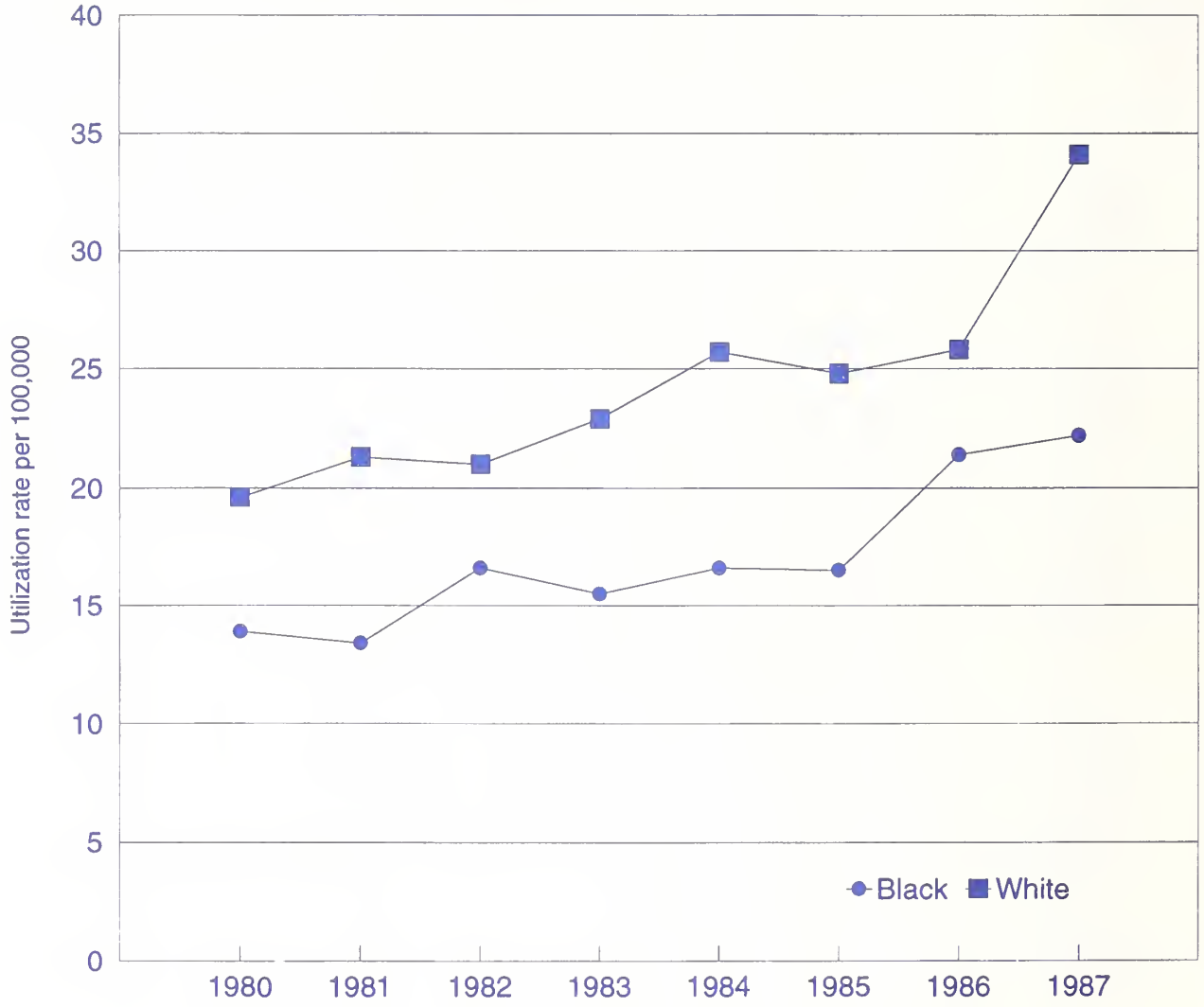
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	129.7 (107.8, 151.7)	137.2 (116.5, 158.0)	117.7 (98.8, 136.5)	122.3 (104.3, 140.3)	124.9 (106.9, 142.9)	121.6 (103.2, 140.1)	124.5 (102.8, 146.2)	111.3 (93.5, 129.0)	–1.7 (–3.2, –0.2)
White	216.5 (203.0, 230.1)	221.2 (208.3, 234.2)	218.4 (204.9, 231.8)	223.5 (211.3, 235.8)	217.1 (205.4, 228.8)	218.6 (205.6, 231.7)	210.7 (197.4, 224.0)	213.0 (200.1, 225.9)	–0.5 (–1.0, 0.0)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

68. Other gallbladder procedures



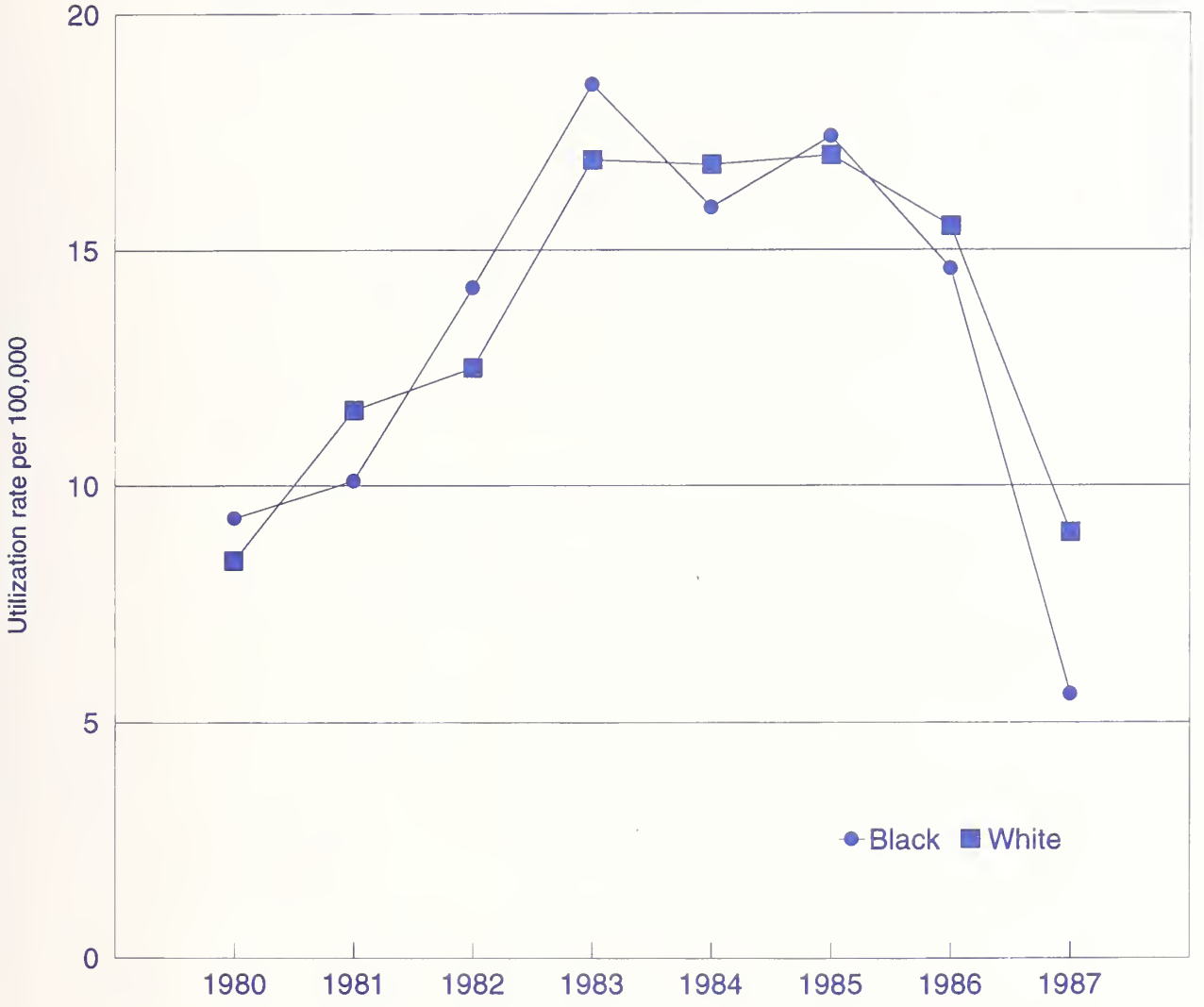
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	13.9	13.4	16.6	15.5	16.6	16.5	21.4	22.2	6.9
	(9.8,	(9.6,	(12.4,	(11.6,	(11.2,	(11.8,	(15.1,	(16.9,	(4.4,
	18.1)	17.2)	20.9)	19.5)	22.0)	21.2)	27.7)	27.4)	9.6)
White	19.6	21.3	21.0	22.9	25.7	24.8	25.8	34.1	6.7
	(17.4,	(18.8,	(19.1,	(20.6,	(23.1,	(22.1,	(22.5,	(30.1,	(4.3,
	21.9)	23.7)	22.9)	25.1)	28.3)	27.5)	29.0)	38.1)	9.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

69. Endoscopic cannulation of pancreas (ERCP)



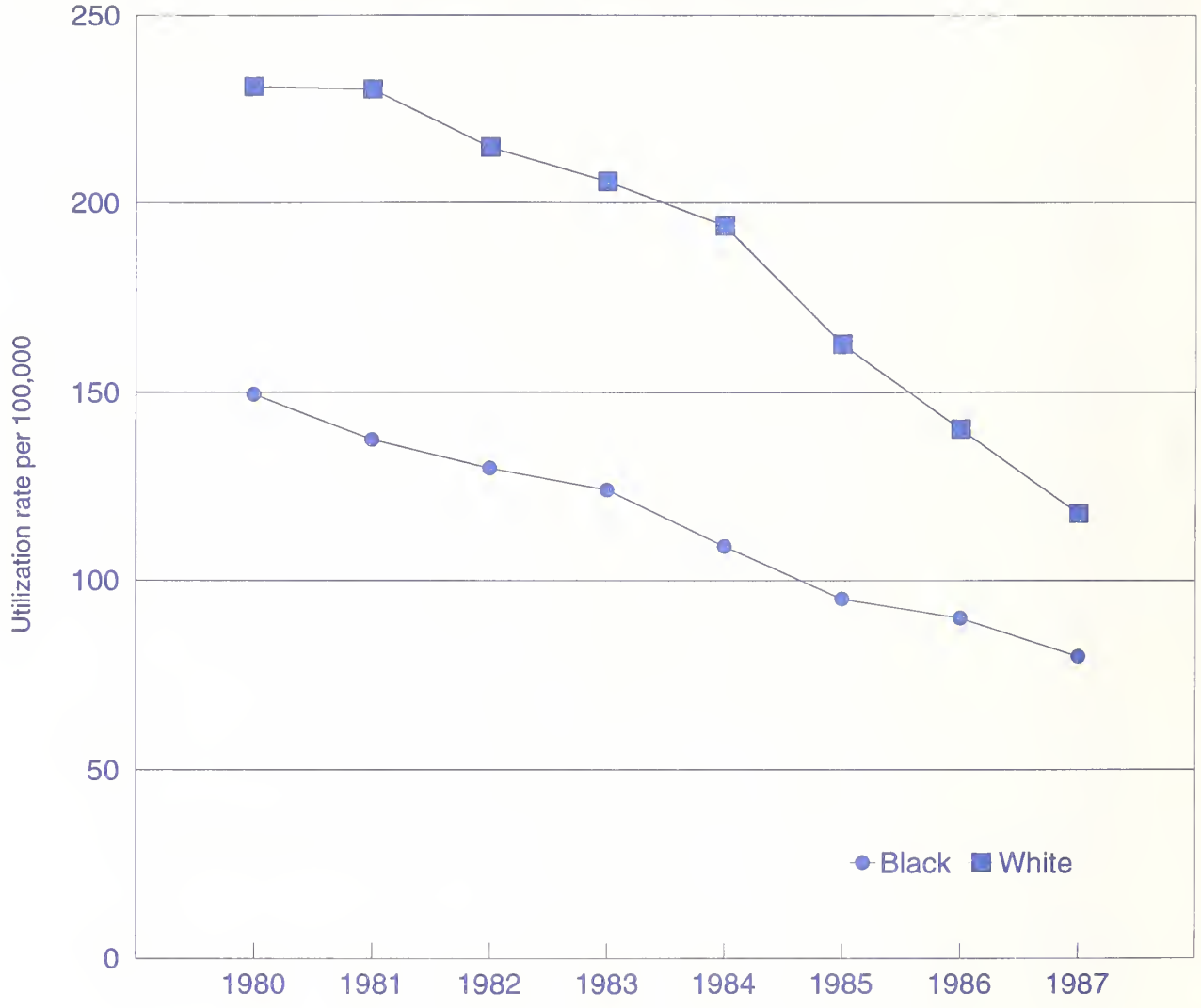
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	9.3 (4.6, 13.9)	10.1 (5.3, 14.8)	14.2 (9.4, 18.9)	18.5 (13.1, 24.0)	15.9 (10.6, 21.1)	17.4 (11.6, 23.2)	14.6 (9.9, 19.3)	5.6 (3.3, 7.8)	−1.5 (−13.7, 12.4)
White	8.4 (5.6, 11.1)	11.6 (8.8, 14.4)	12.5 (9.6, 15.3)	16.9 (13.2, 20.6)	16.8 (13.7, 19.8)	17.0 (13.7, 20.2)	15.5 (12.9, 18.1)	9.0 (7.5, 10.6)	3.5 (−5.4, 13.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

70. Inguinal and femoral hernia repair



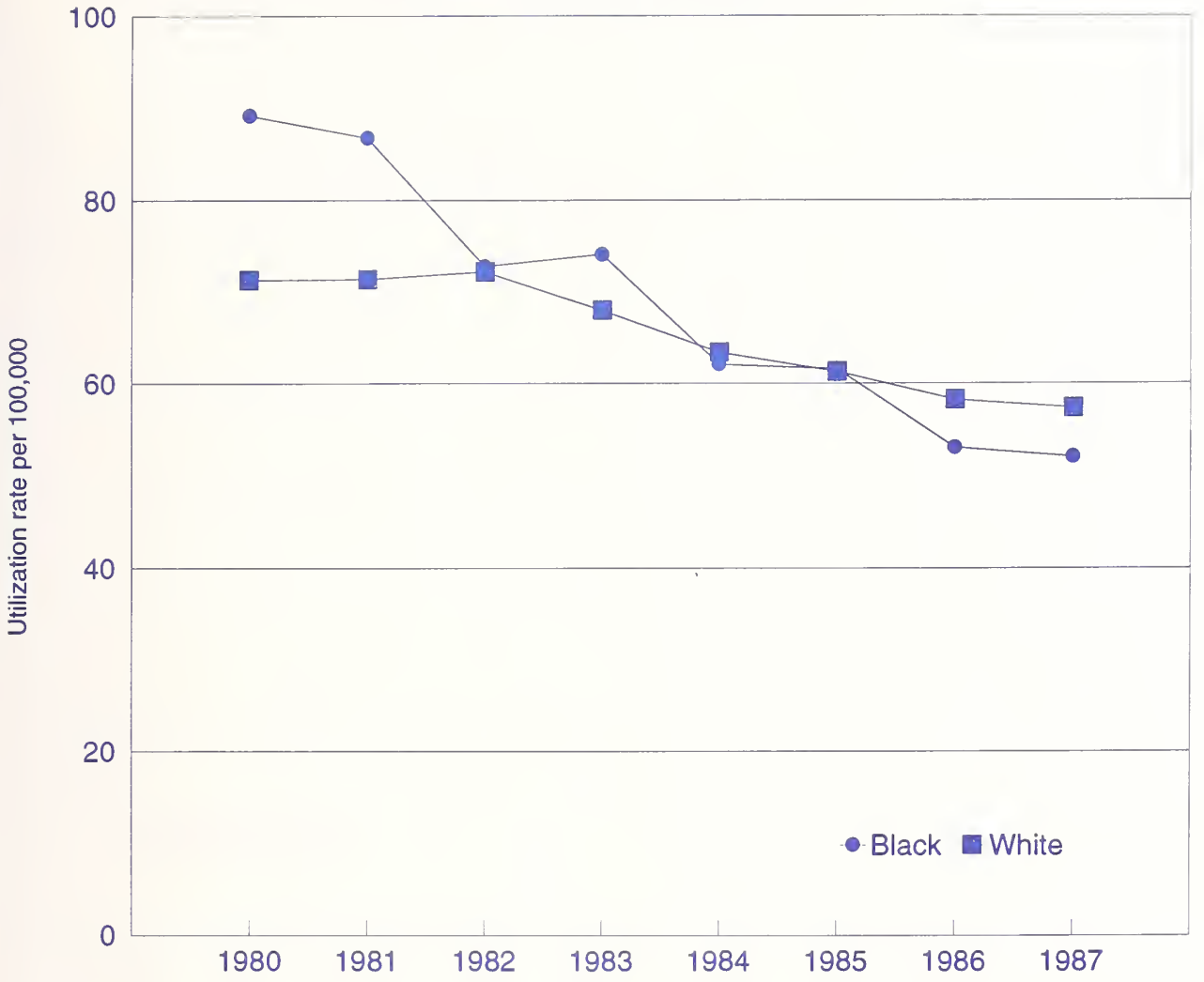
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	149.5 (126.0, 173.0)	137.5 (116.3, 158.7)	129.9 (110.9, 148.9)	124.1 (104.9, 143.3)	109.0 (89.9, 128.1)	95.1 (80.4, 109.8)	90.0 (75.4, 104.7)	79.8 (63.8, 95.8)	–8.6 (–9.5, –7.7)
White	231.0 (217.3, 244.7)	230.2 (216.8, 243.5)	214.7 (201.6, 227.8)	205.6 (193.7, 217.6)	193.8 (182.9, 204.7)	162.7 (152.4, 173.0)	140.3 (130.2, 150.4)	117.7 (108.5, 126.8)	–9.2 (–11.4, –6.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

71. Other hernia repair



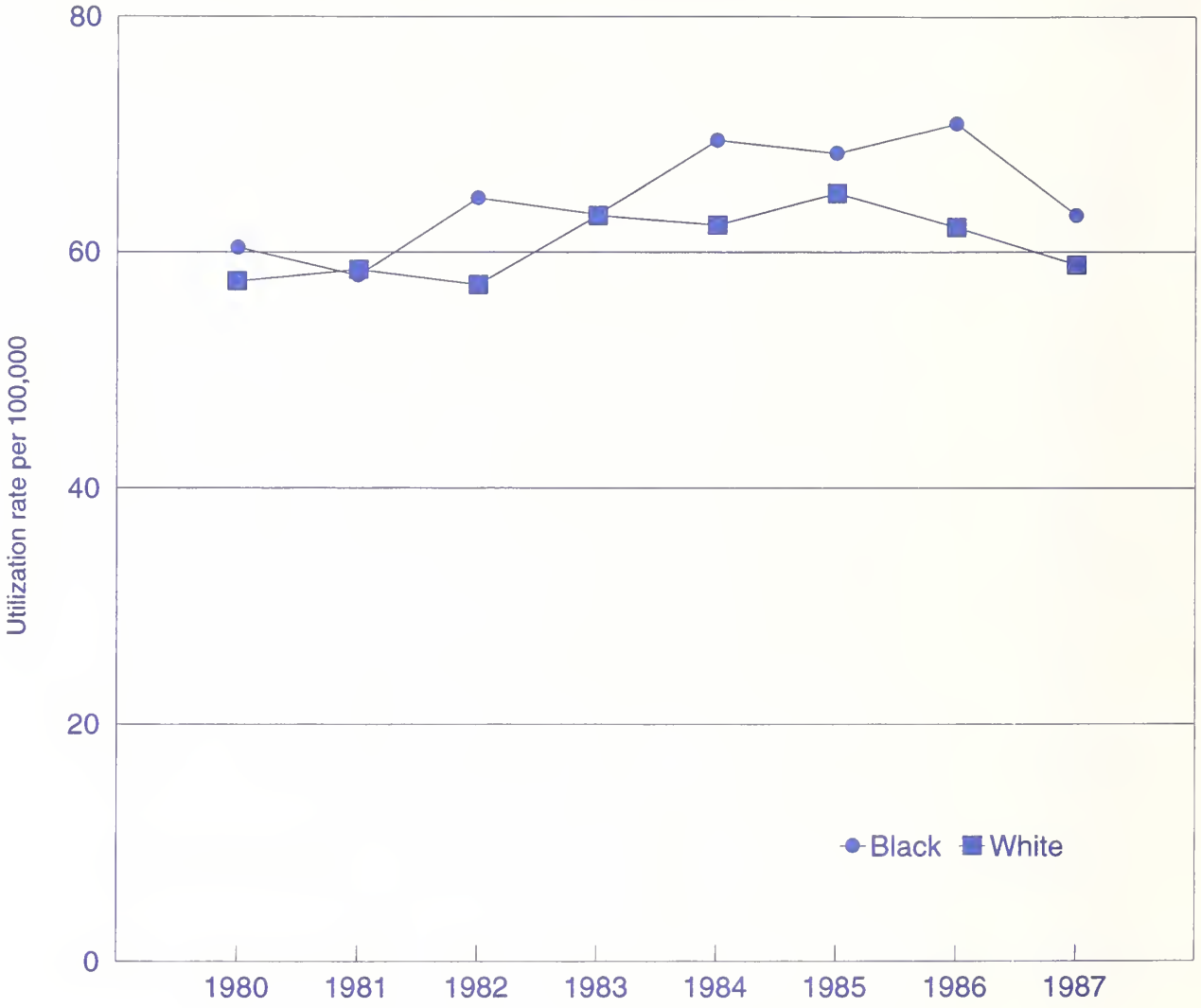
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	89.1 (74.1, 104.1)	86.7 (72.3, 101.1)	72.8 (61.5, 84.1)	74.1 (62.2, 86.0)	62.1 (51.0, 73.1)	61.6 (50.0, 73.2)	53.0 (43.5, 62.5)	52.0 (41.1, 62.9)	−7.9 (−9.1, −6.6)
White	71.3 (65.9, 76.7)	71.4 (66.1, 76.7)	72.2 (66.7, 77.7)	68.0 (63.3, 72.8)	63.4 (58.8, 68.0)	61.3 (56.8, 65.8)	58.2 (53.9, 62.5)	57.3 (52.9, 61.6)	−3.6 (−4.5, −2.8)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

72. Incision of abdominal wall



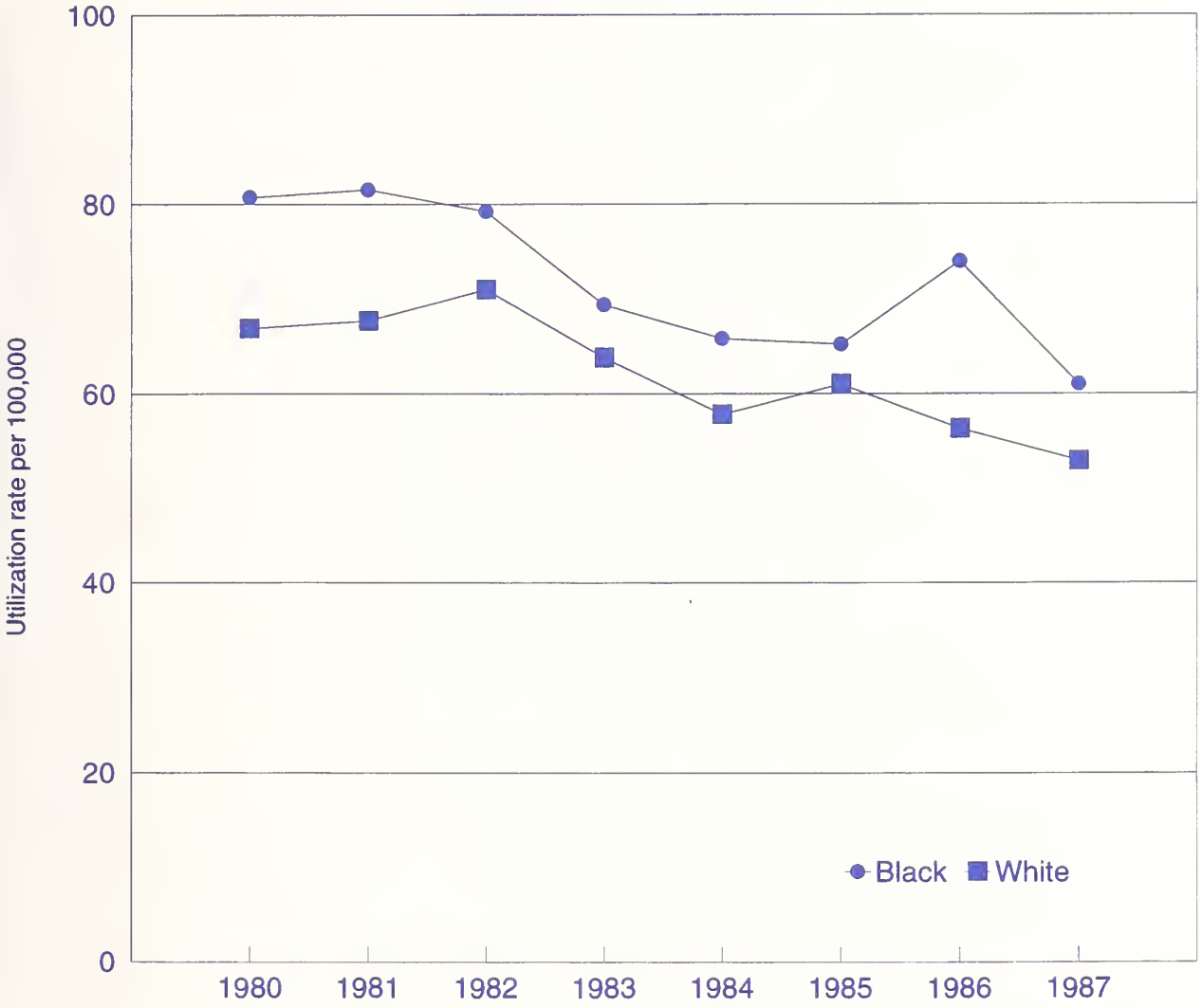
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	60.4 (48.5, 72.4)	58.0 (46.7, 69.2)	64.6 (51.9, 77.3)	63.2 (51.0, 75.4)	69.5 (55.9, 83.2)	68.4 (55.6, 81.2)	70.9 (53.9, 88.0)	63.1 (49.6, 76.7)	1.9 (0.2, 3.7)
White	57.5 (53.4, 61.6)	58.5 (54.6, 62.5)	57.2 (53.1, 61.3)	63.1 (58.3, 67.8)	62.3 (57.9, 66.8)	65.0 (60.0, 69.9)	62.1 (57.3, 66.9)	58.9 (54.0, 63.8)	1.0 (–0.3, 2.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

73. Exploratory laparotomy



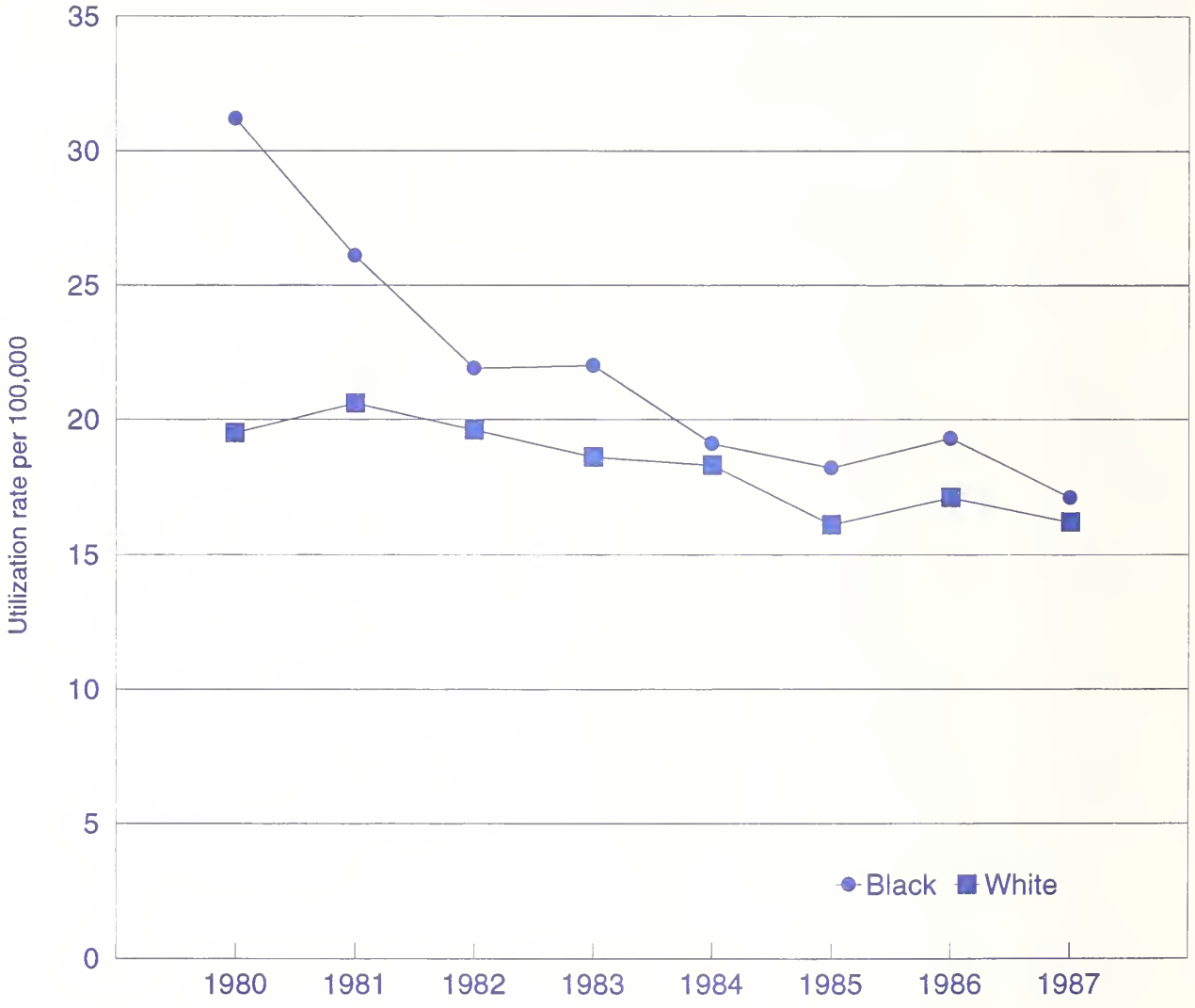
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	80.7	81.5	79.2	69.4	65.8	65.2	74.0	61.0	−3.6
	(60.8,	(62.2,	(63.0,	(56.0,	(54.4,	(46.2,	(51.3,	(45.6,	(−5.6,
	100.5)	100.8)	95.3)	82.8)	77.3)	84.3)	96.6)	76.3)	−1.6)
White	66.9	67.7	71.0	63.8	57.8	61.0	56.3	52.9	−3.6
	(58.2,	(60.5,	(62.1,	(56.2,	(50.9,	(53.8,	(49.8,	(45.1,	(−5.1,
	75.5)	74.9)	80.0)	71.3)	64.6)	68.3)	62.8)	60.8)	−2.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

74. Other laparotomy



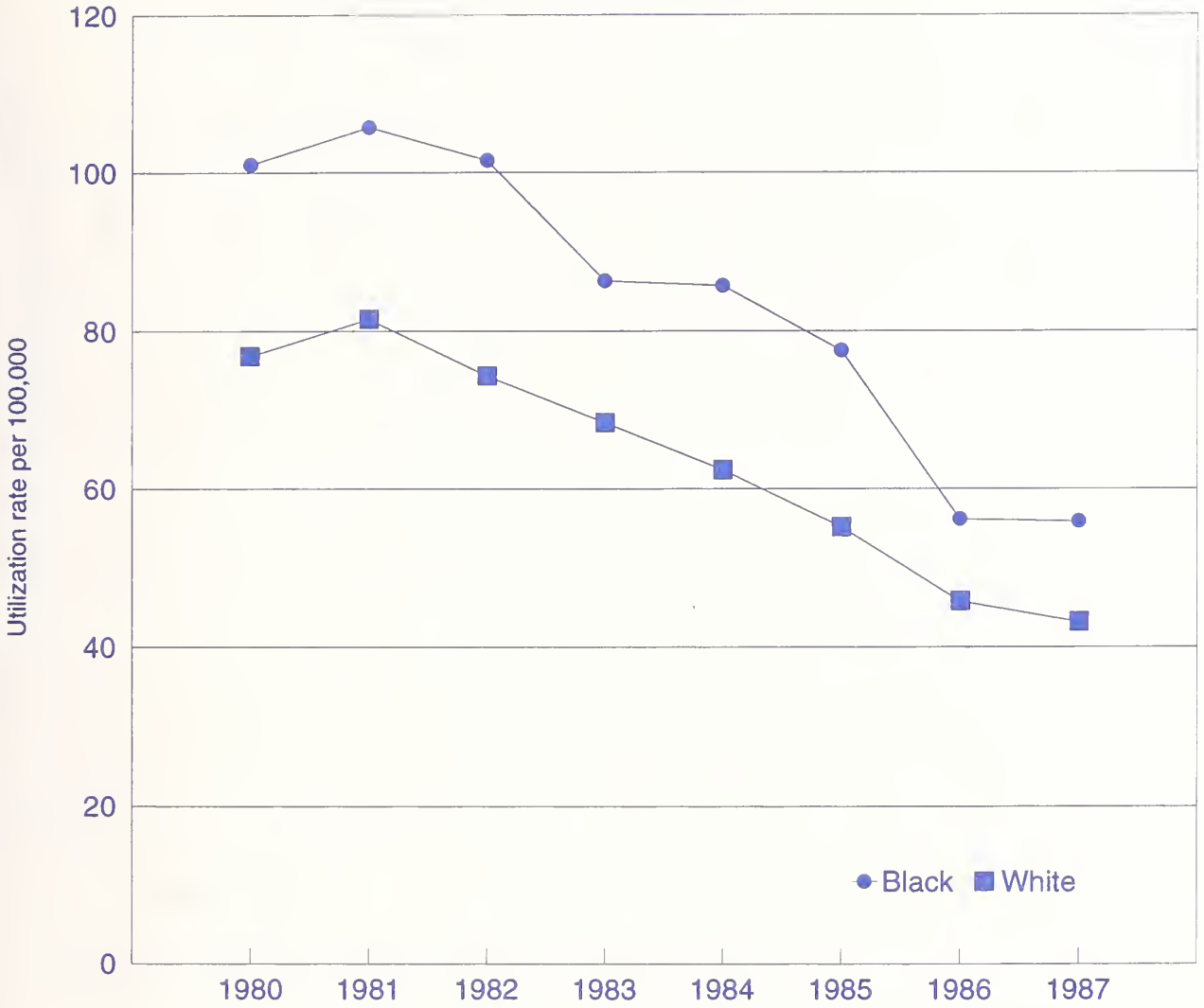
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	31.2 (21.9, 40.5)	26.1 (18.3, 34.0)	21.9 (14.8, 29.1)	22.0 (16.9, 27.0)	19.1 (14.6, 23.6)	18.2 (13.4, 23.0)	19.3 (13.6, 25.0)	17.1 (12.2, 21.9)	−7.4 (−9.6, −5.2)
White	19.5 (17.1, 21.9)	20.6 (18.3, 22.9)	19.6 (17.5, 21.8)	18.6 (16.7, 20.5)	18.3 (16.5, 20.2)	16.1 (14.2, 18.0)	17.1 (15.3, 18.9)	16.2 (14.4, 17.9)	−3.3 (−4.5, −2.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

75. Laparoscopy



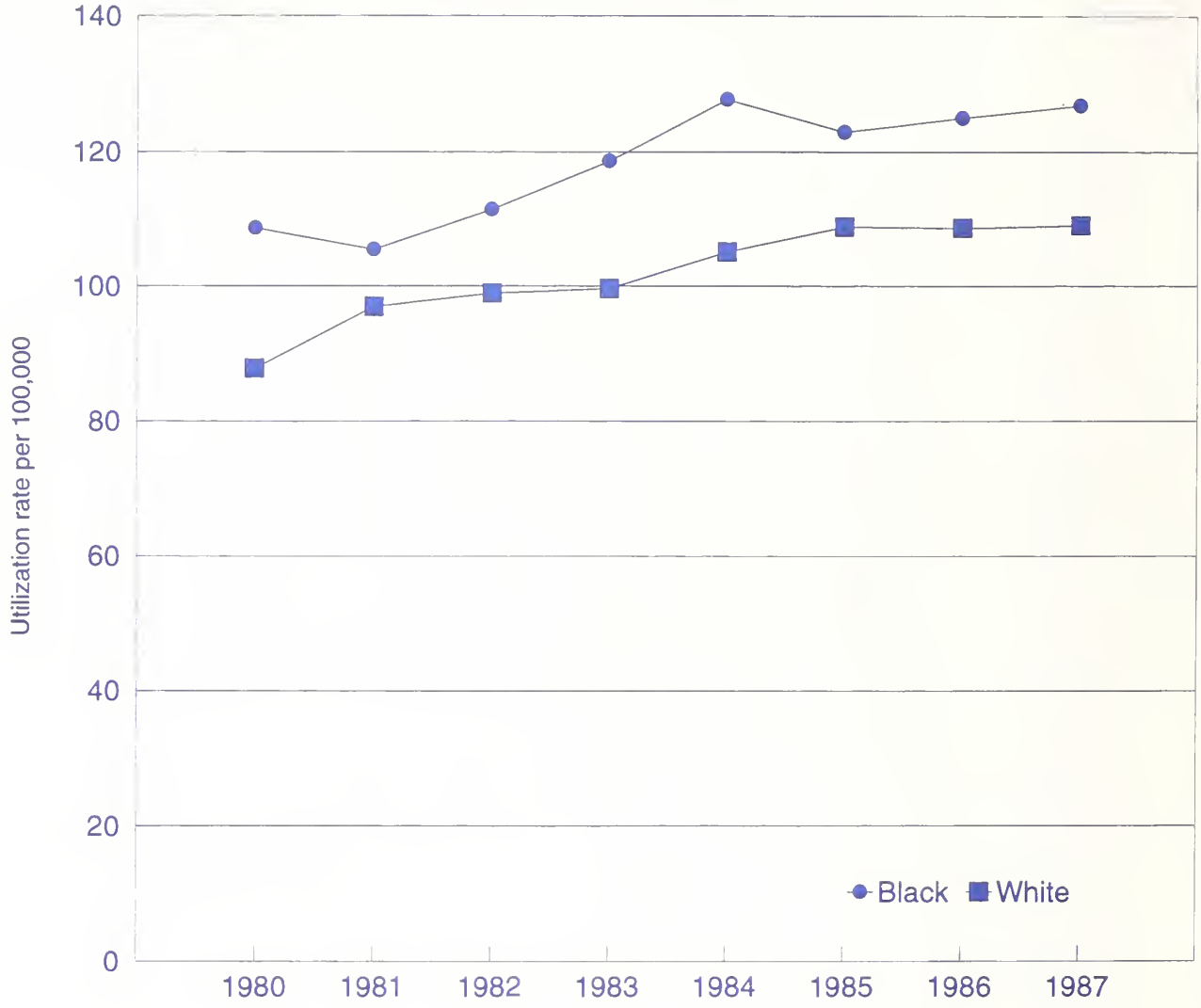
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	101.0	105.7	101.5	86.3	85.7	77.5	56.1	55.8	–9.2
	(74.9,	(76.5,	(79.5,	(64.8,	(58.1,	(48.0,	(37.7,	(40.7,	(–11.9,
	127.0)	134.9)	123.5)	107.8)	113.3)	107.1)	74.6)	71.0)	–6.5)
White	76.8	81.5	74.3	68.4	62.4	55.1	45.7	43.1	–9.0
	(67.4,	(72.4,	(66.7,	(61.3,	(55.9,	(47.9,	(39.6,	(36.7,	(–10.9,
	86.2)	90.7)	81.8)	75.5)	68.9)	62.2)	51.8)	49.4)	–7.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

76. Excision, lysis peritoneal tissue



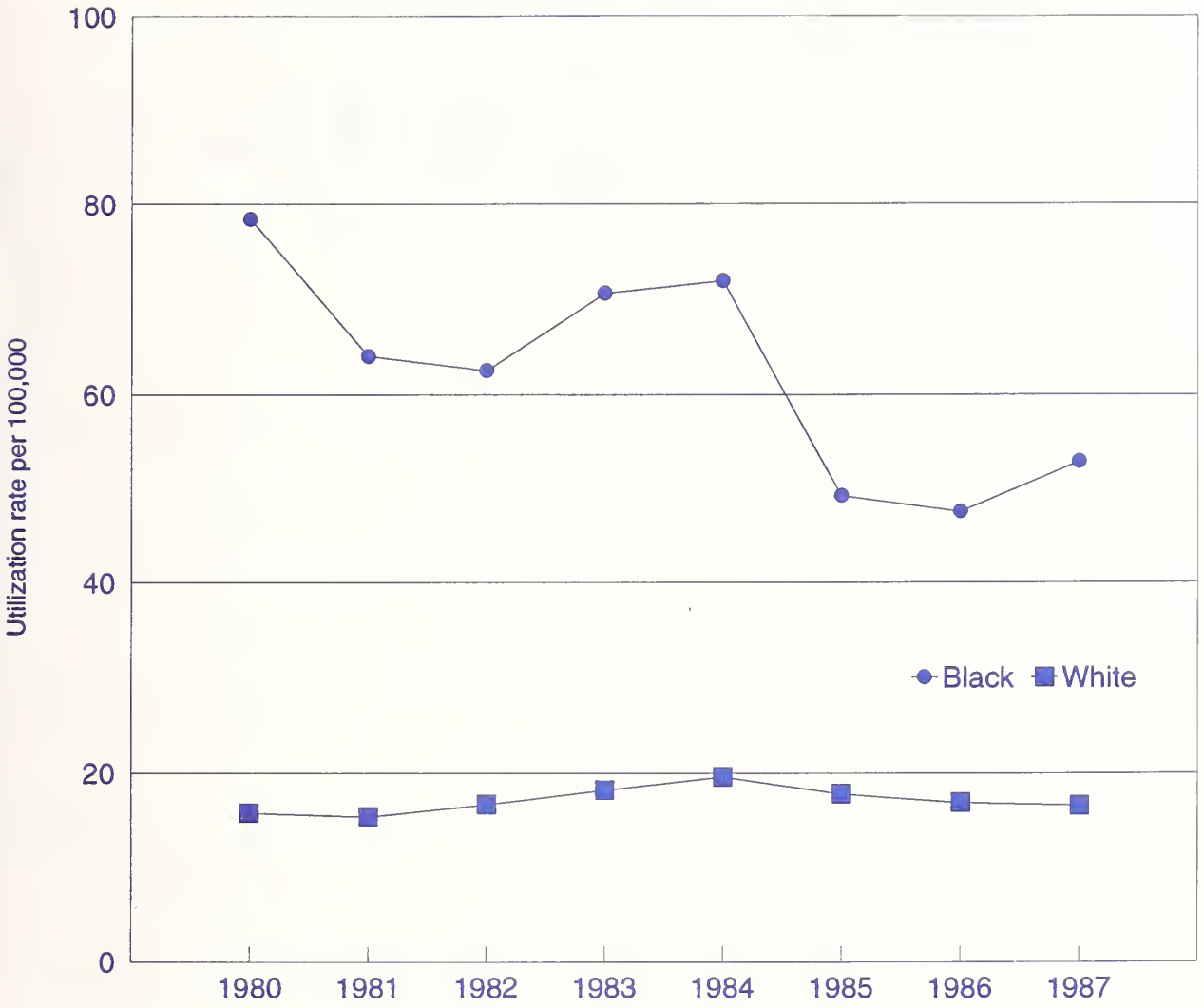
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	108.6 (87.2, 130.0)	105.4 (82.7, 128.1)	111.4 (88.7, 134.1)	118.6 (98.7, 138.4)	127.7 (105.9, 149.5)	122.9 (100.2, 145.6)	125.0 (101.2, 148.9)	126.8 (101.1, 152.5)	2.8 (1.7, 3.9)
White	87.8 (79.7, 95.9)	96.9 (88.1, 105.7)	98.9 (90.1, 107.6)	99.6 (90.9, 108.2)	105.0 (96.2, 113.8)	108.8 (98.7, 118.8)	108.6 (97.8, 119.5)	109.0 (97.6, 120.4)	2.9 (2.1, 3.8)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

77. Peritoneal dialysis



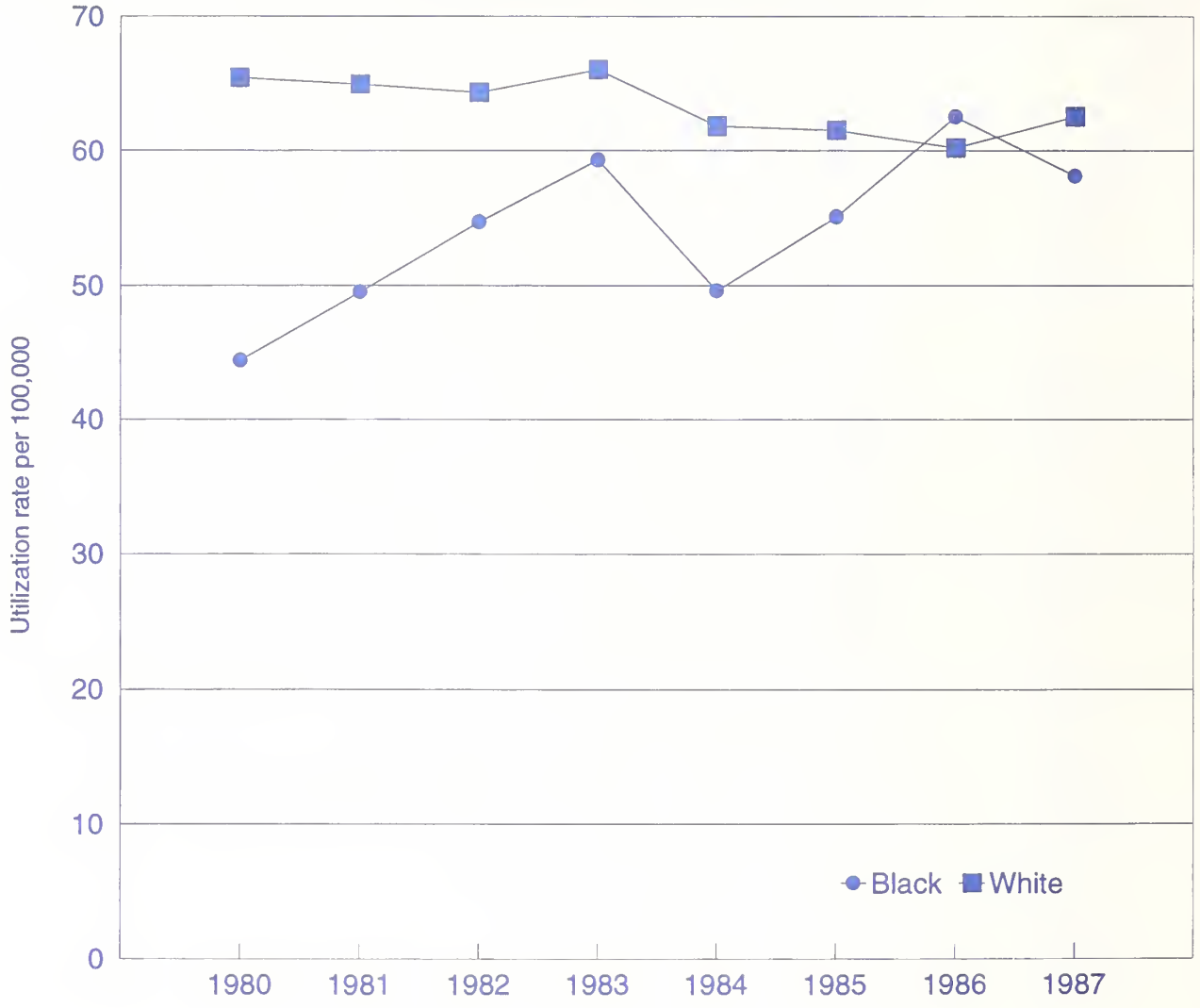
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	78.4 (23.4, 133.5)	64.0 (21.1, 107.0)	62.5 (20.5, 104.5)	70.6 (27.0, 114.2)	71.9 (29.4, 114.3)	49.2 (29.4, 69.1)	47.5 (27.3, 67.8)	52.9 (25.8, 80.0)	–5.7 (–9.3, –2.0)
White	15.8 (11.4, 20.1)	15.4 (11.2, 19.7)	16.7 (12.3, 21.1)	18.2 (13.4, 23.0)	19.6 (15.3, 23.8)	17.8 (14.5, 21.1)	16.9 (13.8, 20.0)	16.6 (13.6, 19.6)	1.3 (–1.0, 3.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

78. Other upper gastrointestinal procedures



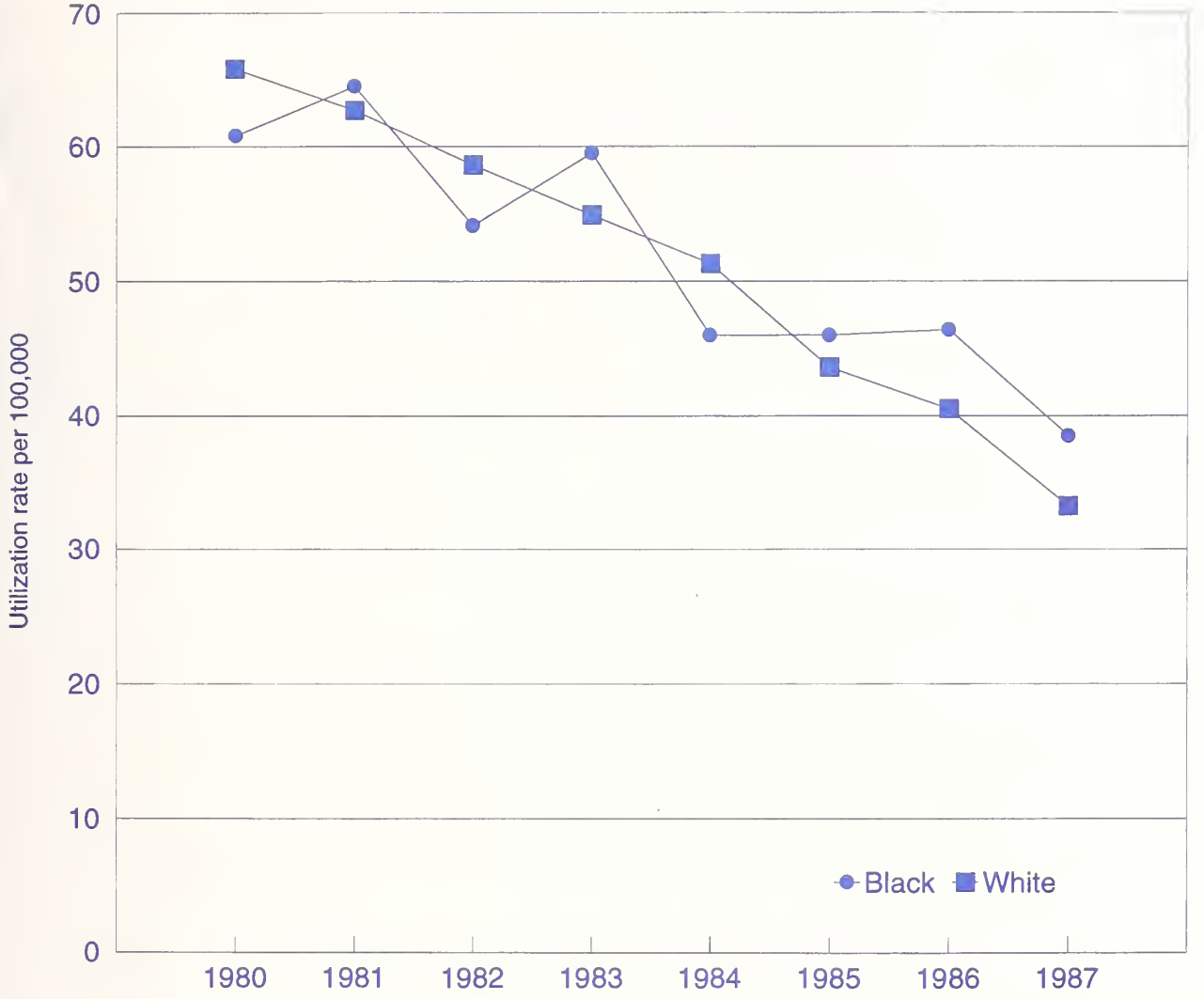
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	44.4 (35.4, 53.5)	49.5 (41.0, 58.0)	54.7 (45.3, 64.0)	59.3 (47.6, 71.0)	49.6 (39.8, 59.5)	55.1 (43.2, 67.0)	62.5 (49.3, 75.7)	58.1 (47.4, 68.8)	3.5 (1.0, 6.1)
White	65.4 (59.5, 71.3)	64.9 (59.3, 70.4)	64.3 (59.2, 69.3)	66.0 (60.6, 71.4)	61.8 (56.9, 66.7)	61.5 (56.3, 66.7)	60.2 (54.6, 65.7)	62.5 (56.5, 68.5)	−1.1 (−1.7, −0.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

79. Other anal and rectal procedures



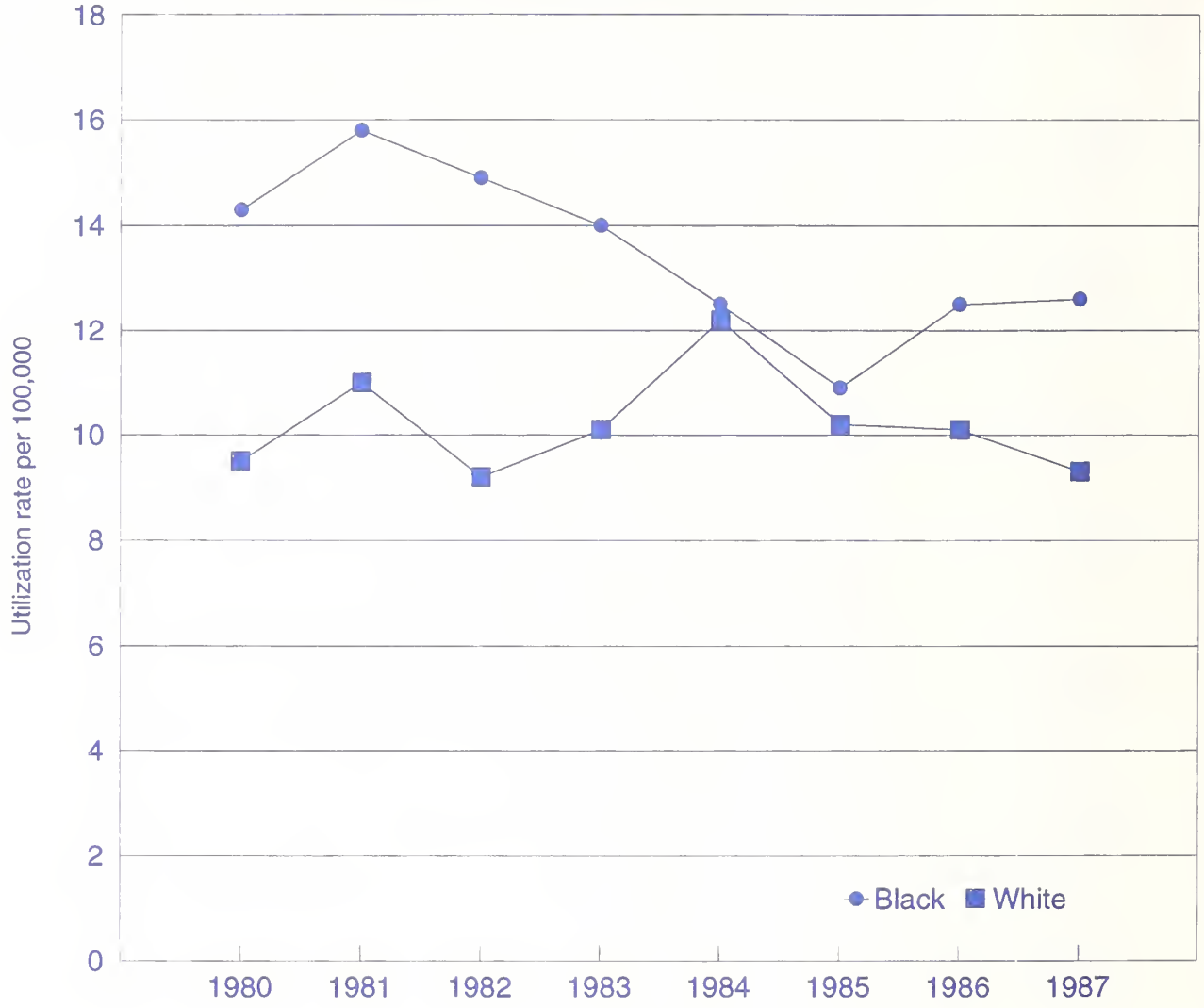
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	60.8 (47.9, 73.7)	64.5 (52.7, 76.3)	54.1 (43.5, 64.7)	59.5 (48.5, 70.5)	46.0 (37.9, 54.2)	46.0 (35.4, 56.5)	46.4 (35.8, 57.0)	38.5 (29.7, 47.2)	–6.4 (–8.6, –4.2)
White	65.8 (59.4, 72.3)	62.7 (56.5, 68.8)	58.6 (52.6, 64.7)	54.9 (50.3, 59.5)	51.3 (46.8, 55.8)	43.6 (39.3, 47.8)	40.5 (35.9, 45.1)	33.2 (29.2, 37.2)	–9.0 (–10.5, –7.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

80. Other gastrointestinal biopsy, endoscopy



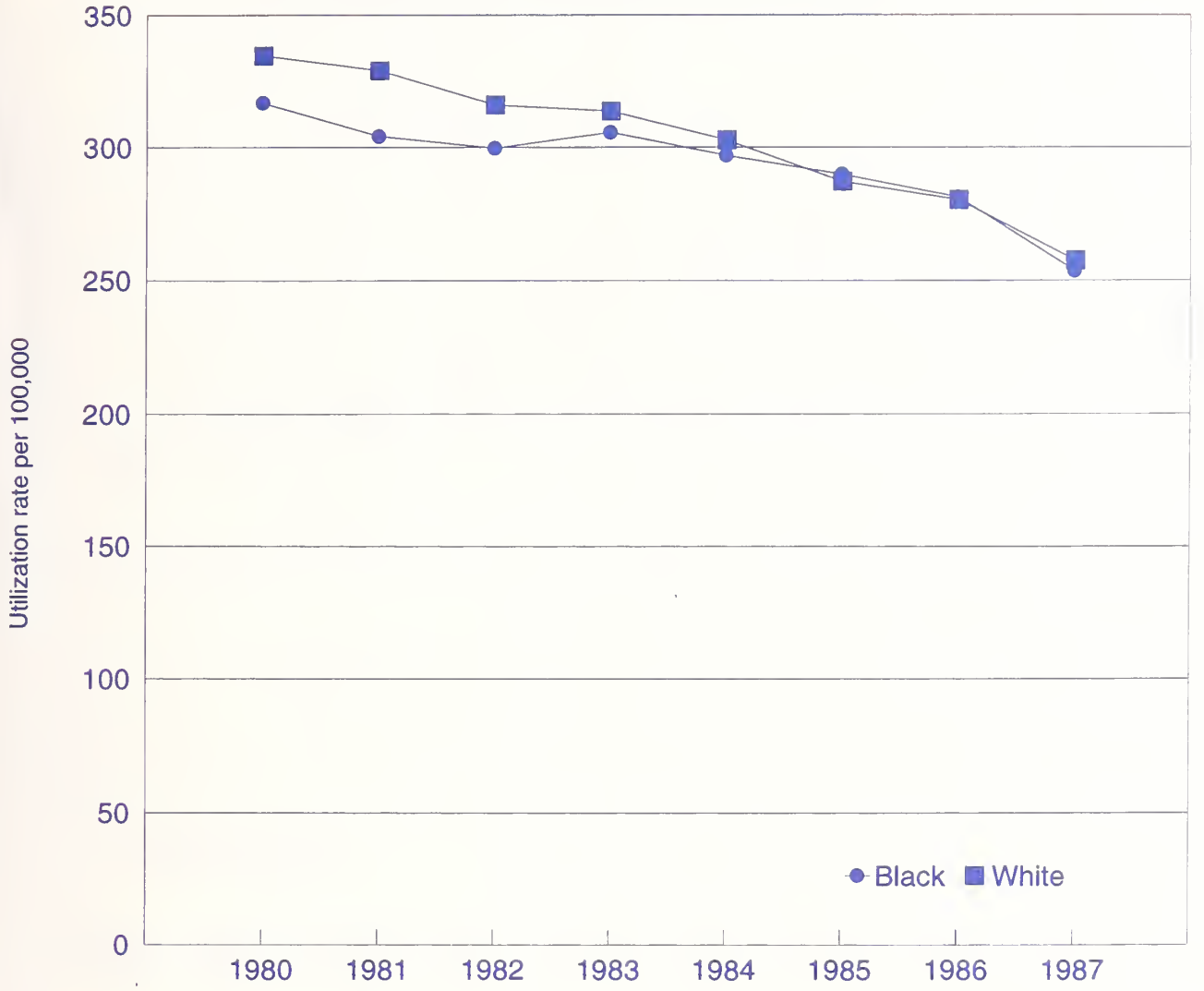
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	14.3	15.8	14.9	14.0	12.5	10.9	12.5	12.6	–3.7
	(9.9,	(9.3,	(9.7,	(10.3,	(8.9,	(7.7,	(8.6,	(8.2,	(–6.1,
	18.7)	22.4)	20.1)	17.7)	16.2)	14.1)	16.5)	16.9)	–1.2)
White	9.5	11.0	9.2	10.1	12.2	10.2	10.1	9.3	–0.1
	(8.3,	(9.4,	(8.1,	(9.0,	(10.7,	(8.9,	(8.3,	(7.9,	(–3.2,
	10.7)	12.5)	10.2)	11.3)	13.7)	11.4)	11.8)	10.6)	3.0)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

81. Other gastrointestinal procedures



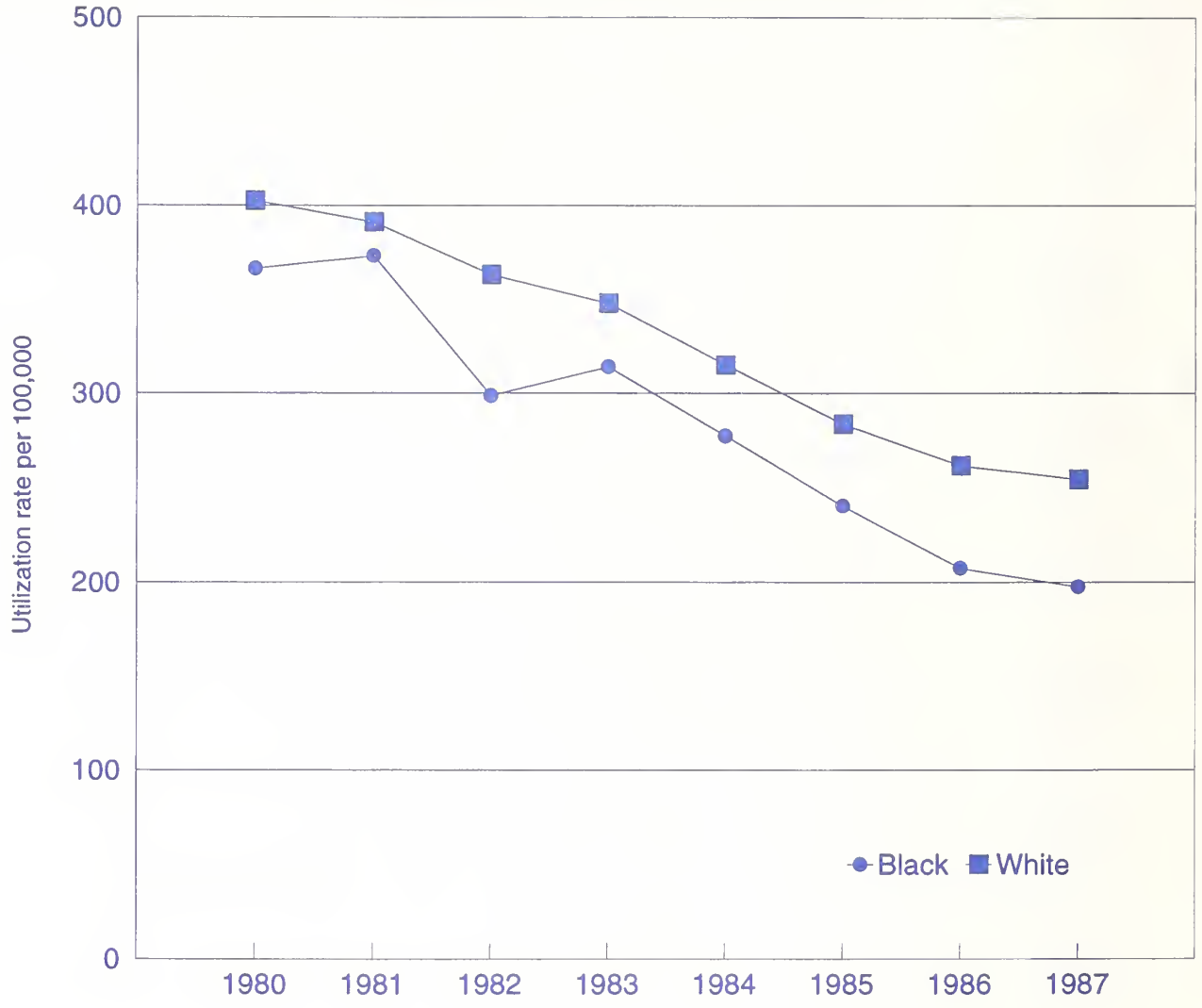
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	316.7 (270.9, 362.5)	304.1 (264.3, 343.9)	299.7 (253.6, 345.8)	305.6 (259.0, 352.1)	296.9 (252.5, 341.3)	289.8 (248.0, 331.7)	281.2 (228.6, 333.7)	253.5 (206.7, 300.2)	−2.4 (−3.4, −1.4)
White	334.6 (311.5, 357.6)	328.9 (306.2, 351.6)	316.0 (294.8, 337.2)	313.6 (294.5, 332.6)	302.7 (285.1, 320.4)	287.1 (267.8, 306.4)	280.2 (260.1, 300.2)	257.5 (238.0, 277.0)	−3.5 (−4.1, −2.8)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

82. Endoscopy of the urinary tract



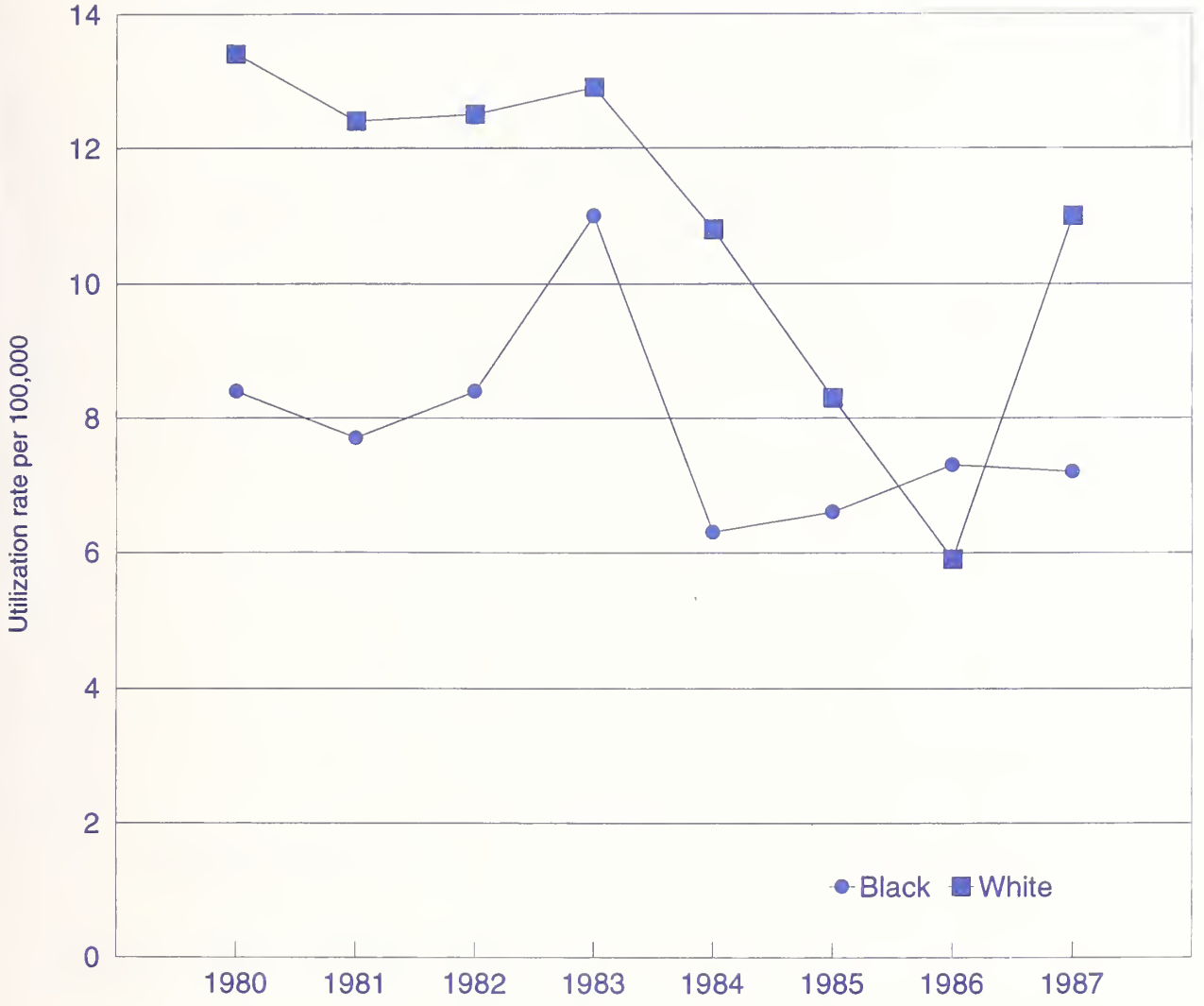
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	366.3 (285.3, 447.3)	373.2 (294.3, 452.1)	298.5 (240.3, 356.8)	313.8 (259.7, 367.9)	277.4 (231.8, 323.0)	240.4 (195.7, 285.0)	207.4 (167.9, 246.8)	197.4 (160.6, 234.3)	–9.1 (–10.8, –7.4)
White	402.5 (367.0, 437.9)	391.2 (356.6, 425.9)	363.0 (333.3, 392.7)	347.7 (323.2, 372.3)	314.9 (291.9, 337.8)	283.6 (261.4, 305.8)	261.6 (238.9, 284.3)	254.4 (233.8, 274.9)	–7.0 (–7.7, –6.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

83. Surgical removal of urinary calculus



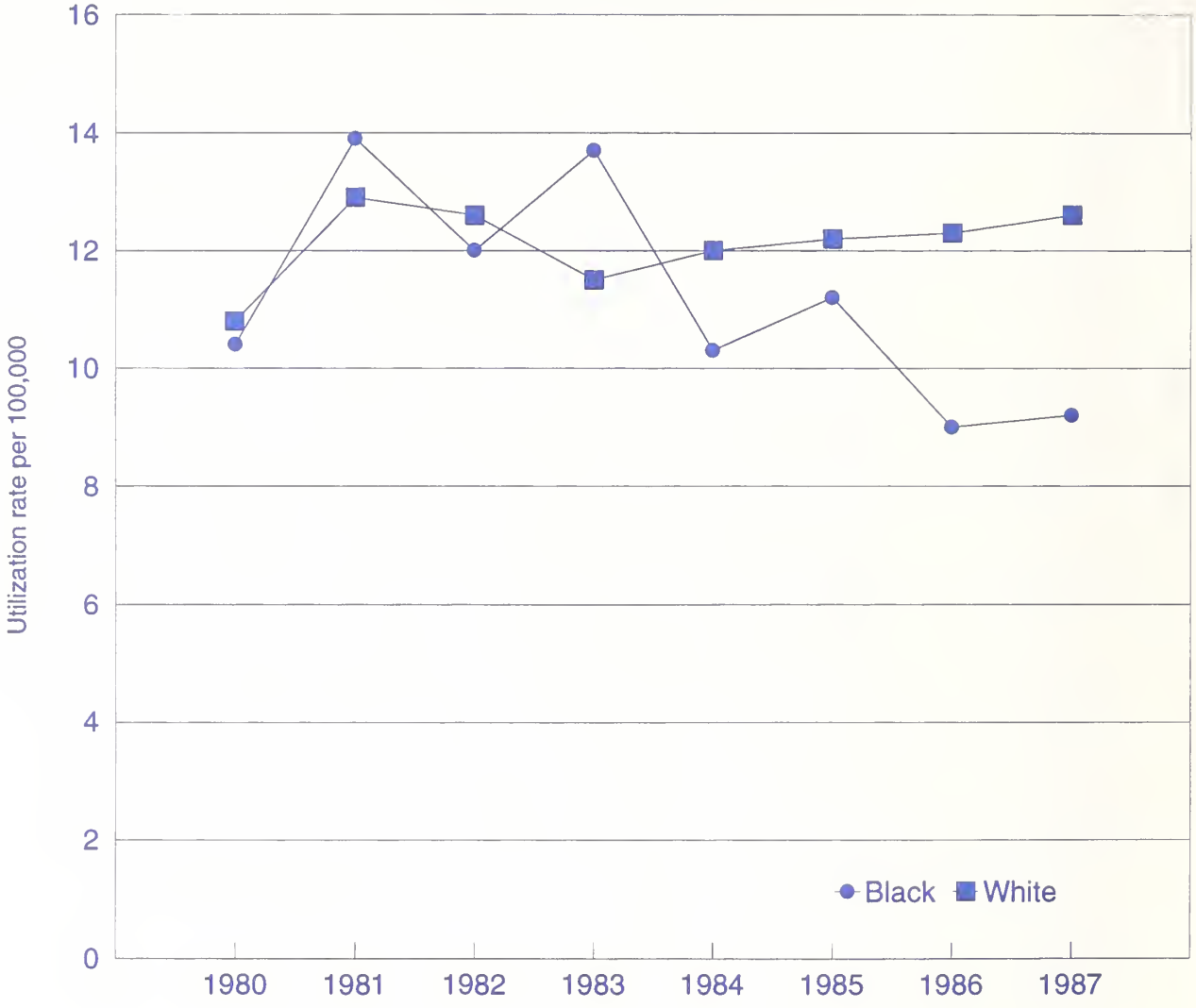
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	8.4	7.7	8.4	11.0	6.3	6.6	7.3	7.2	–3.0
	(5.0,	(4.7,	(5.4,	(7.0,	(3.7,	(3.8,	(4.5,	(4.1,	(–7.8,
	11.9)	10.6)	11.4)	14.9)	9.0)	9.4)	10.0)	10.3)	2.0)
White	13.4	12.4	12.5	12.9	10.8	8.3	5.9	11.0	–7.5
	(11.5,	(11.0,	(11.0,	(11.4,	(9.2,	(7.0,	(4.8,	(8.9,	(–13.6,
	15.4)	13.9)	14.0)	14.5)	12.3)	9.6)	7.0)	13.0)	–1.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

84. Nephrectomy



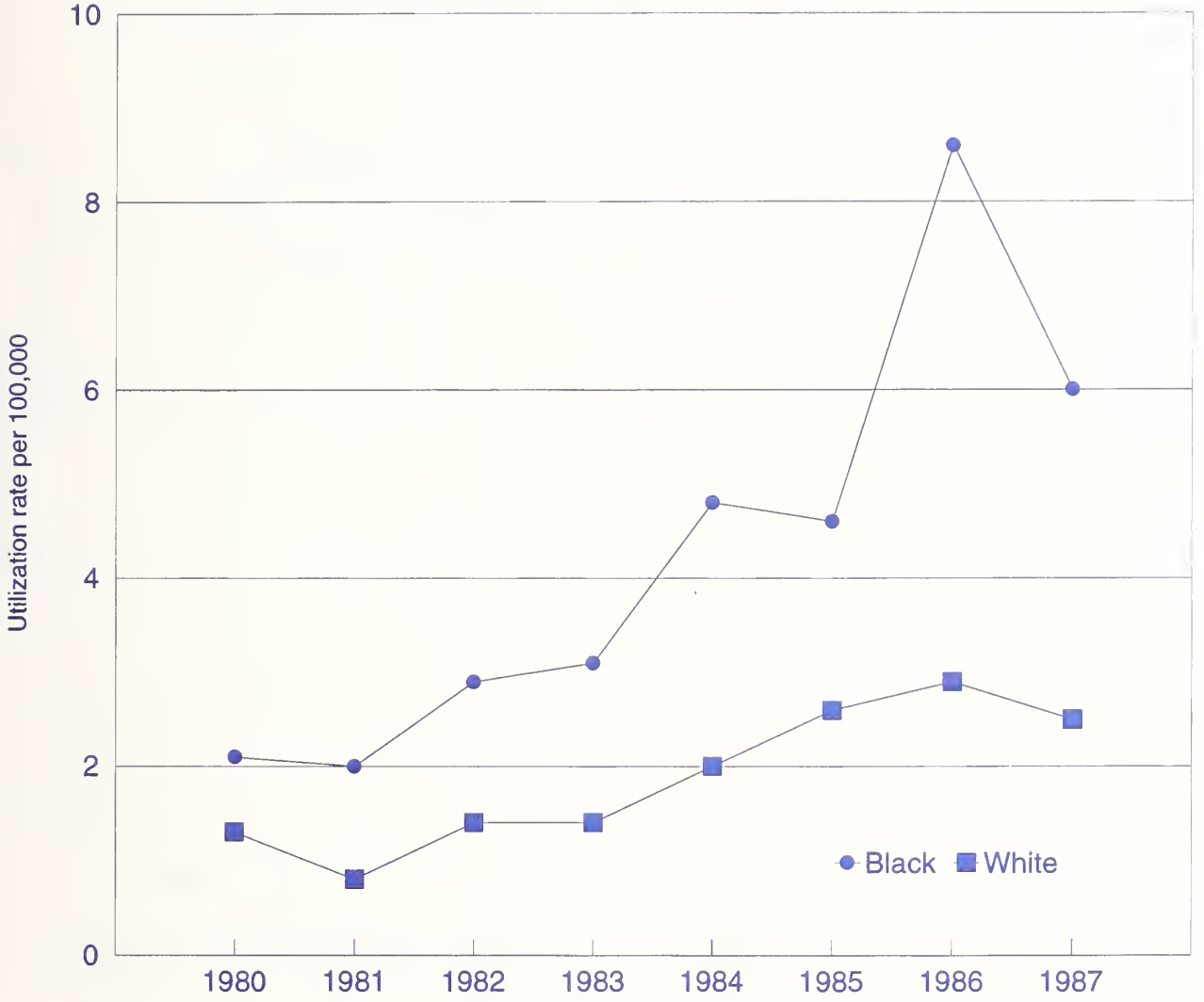
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	10.4	13.9	12.0	13.7	10.3	11.2	9.0	9.2	–4.1
	(6.8,	(9.5,	(7.9,	(10.0,	(7.1,	(6.8,	(5.7,	(5.0,	(–8.1,
	14.0)	18.3)	16.0)	17.4)	13.5)	15.7)	12.2)	13.4)	0.1)
White	10.8	12.9	12.6	11.5	12.0	12.2	12.3	12.6	1.0
	(9.4,	(11.3,	(11.0,	(10.1,	(10.5,	(10.6,	(10.9,	(11.0,	(–0.7,
	12.3)	14.4)	14.2)	13.0)	13.5)	13.8)	13.7)	14.3)	2.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

85. Kidney transplant



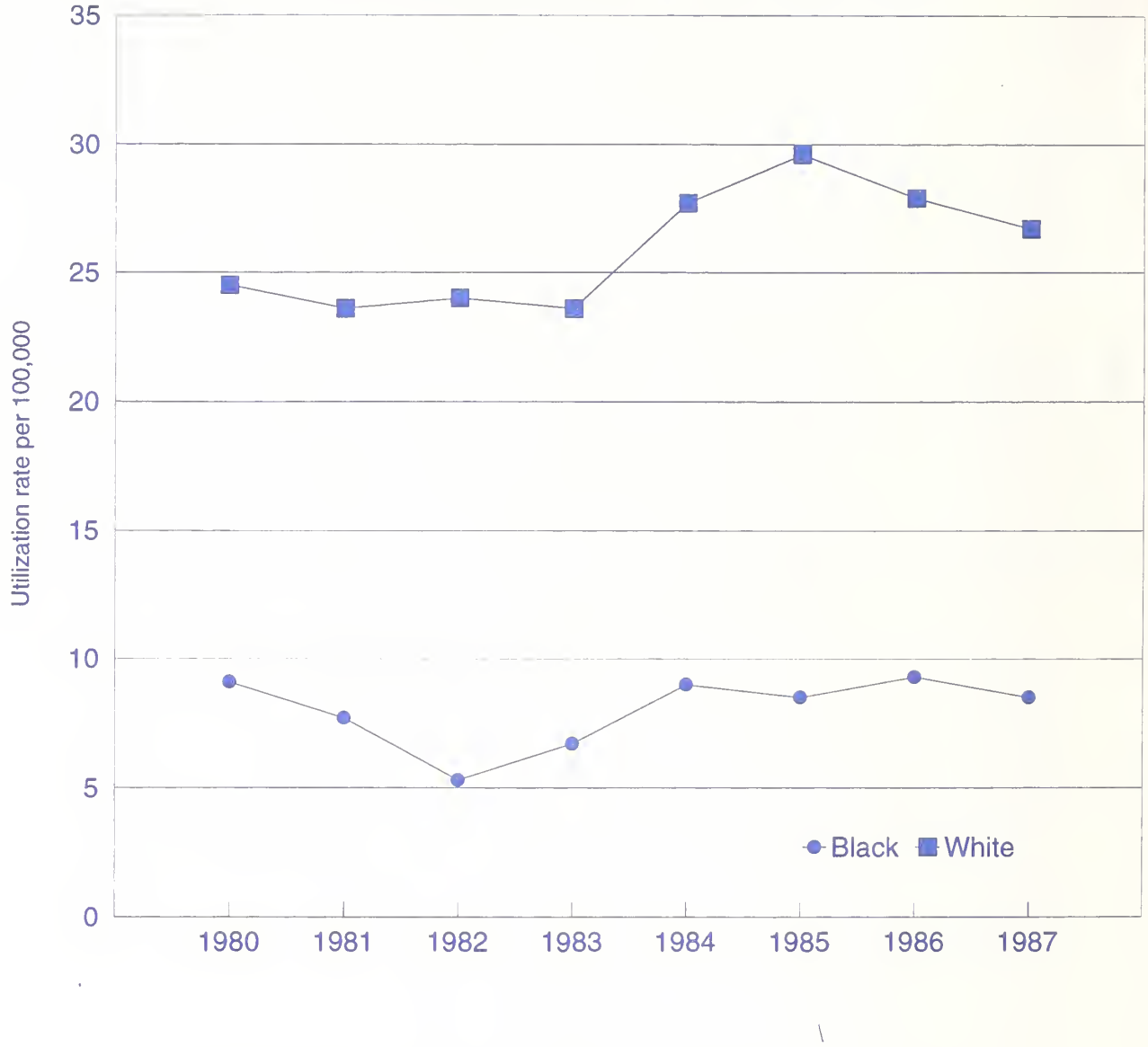
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	2.1 (0.4, 3.8)	2.0 (0.2, 3.8)	2.9 (1.1, 4.7)	3.1 (1.1, 5.2)	4.8 (1.4, 8.1)	4.6 (0.0, 9.5)	8.6 (1.3, 15.9)	6.0 (1.0, 11.0)	21.6 (14.6, 29.0)
White	1.3 (0.6, 2.0)	0.8 (0.3, 1.4)	1.4 (0.4, 2.5)	1.4 (0.4, 2.5)	2.0 (0.7, 3.3)	2.6 (0.4, 4.9)	2.9 (0.6, 5.1)	2.5 (0.7, 4.3)	16.6 (8.8, 25.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

86. Transurethral removal of urinary obstruction



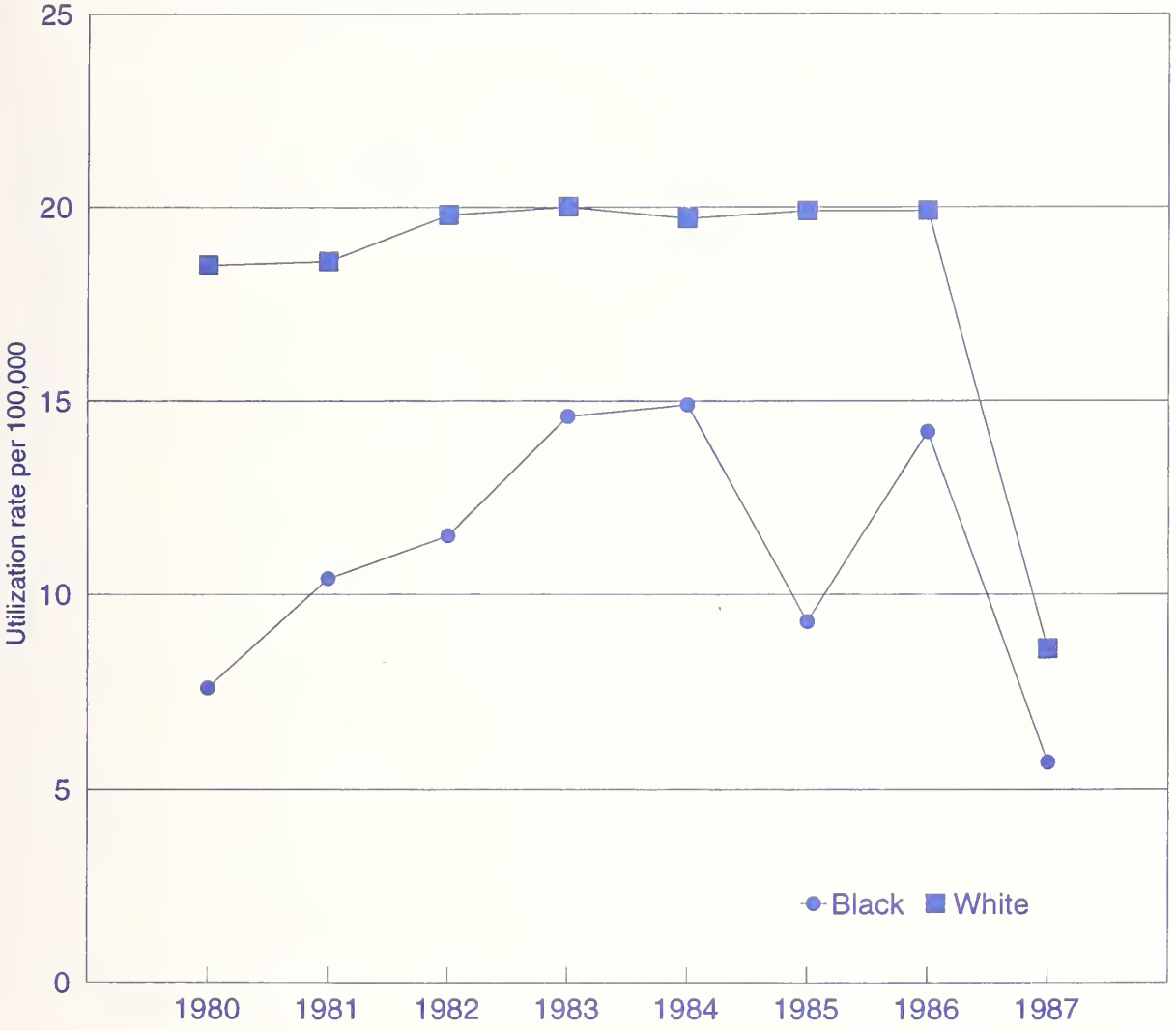
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	9.1 (5.0, 13.1)	7.7 (4.9, 10.5)	5.3 (3.3, 7.4)	6.7 (4.4, 9.0)	9.0 (5.7, 12.2)	8.5 (5.2, 11.7)	9.3 (5.8, 12.7)	8.5 (4.8, 12.2)	2.6 (–3.3, 8.8)
White	24.5 (20.8, 28.1)	23.6 (19.5, 27.6)	24.0 (20.1, 27.9)	23.6 (20.6, 26.6)	27.7 (24.3, 31.0)	29.6 (25.3, 33.9)	27.9 (24.1, 31.8)	26.7 (23.4, 30.0)	2.7 (0.7, 4.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

87. Ureterotomy



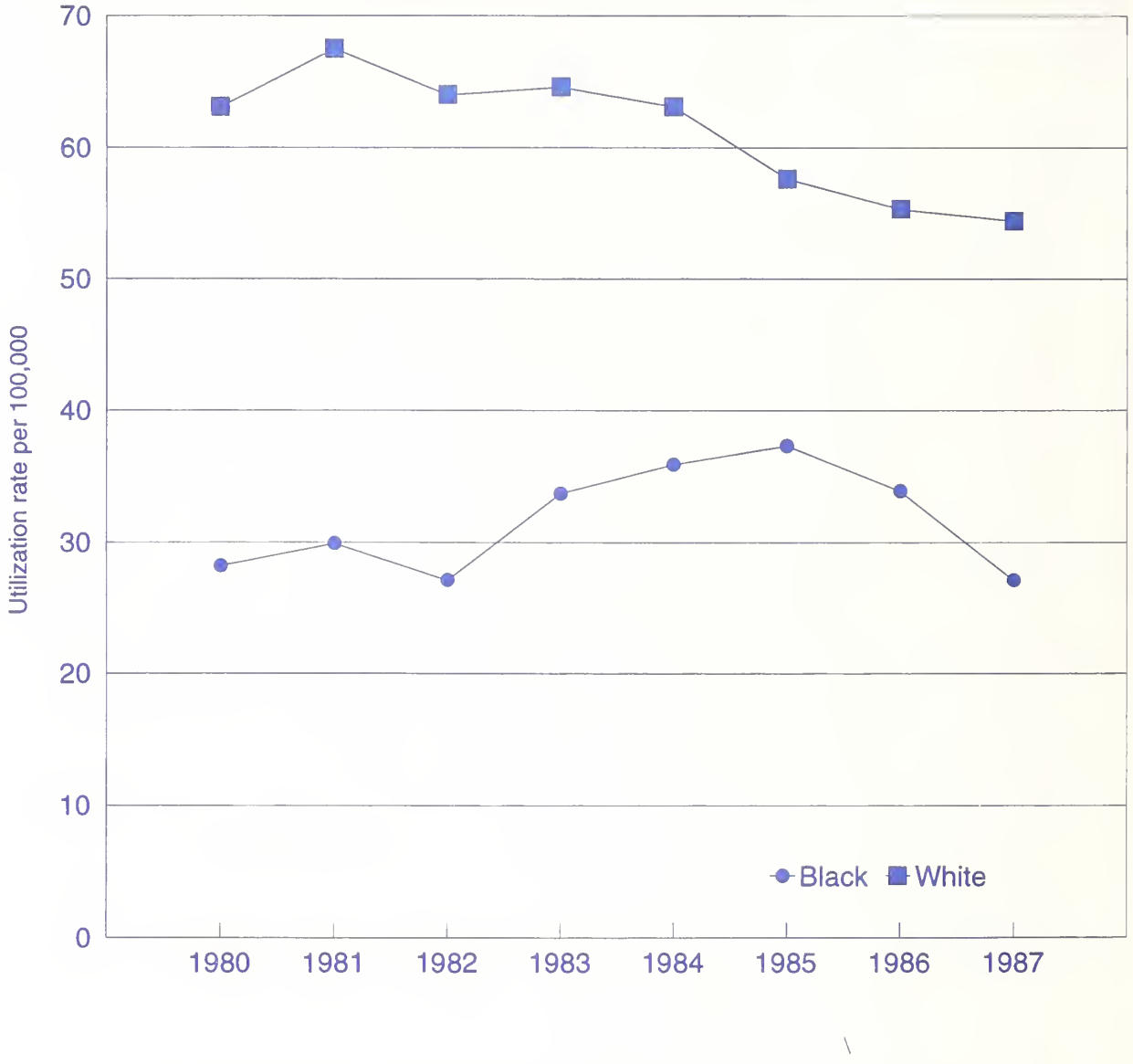
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	7.6	10.4	11.5	14.6	14.9	9.3	14.2	5.7	–1.2
	(5.0,	(7.3,	(8.1,	(10.7,	(10.2,	(6.0,	(9.4,	(3.1,	(–11.6,
	10.3)	13.5)	14.8)	18.6)	19.6)	12.6)	19.0)	8.4)	10.4)
White	18.5	18.6	19.8	20.0	19.7	19.9	19.9	8.6	–5.8
	(16.4,	(16.4,	(17.8,	(17.9,	(17.3,	(16.8,	(16.5,	(7.2,	(–13.2,
	20.6)	20.8)	21.8)	22.1)	22.1)	23.0)	23.4)	10.1)	2.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

88. Transurethral biopsy, bladder tissue



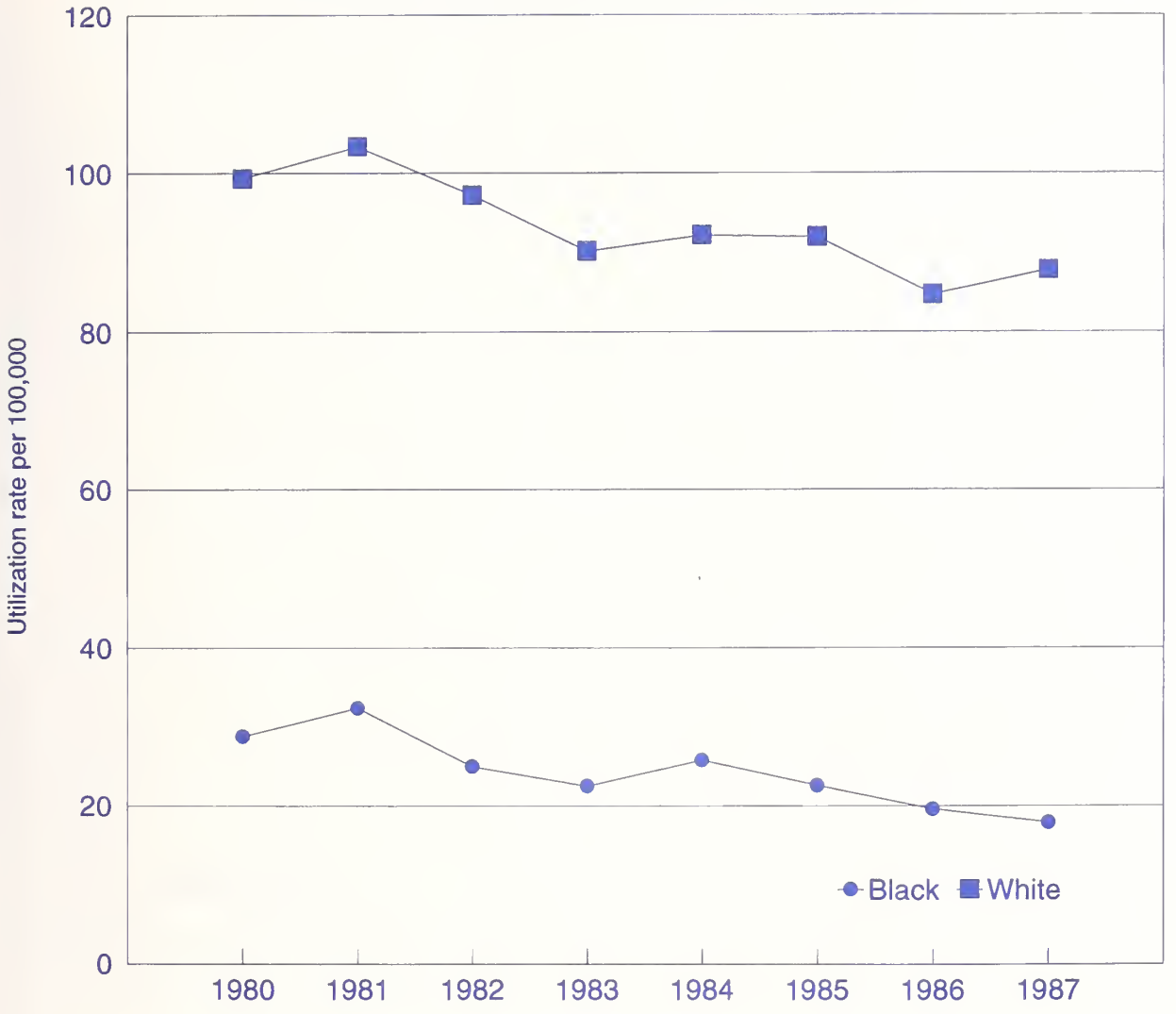
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	28.2 (21.4, 35.1)	29.9 (22.7, 37.1)	27.1 (20.6, 33.6)	33.7 (26.1, 41.4)	35.9 (27.5, 44.2)	37.3 (28.4, 46.2)	33.9 (25.8, 42.1)	27.1 (20.5, 33.7)	1.6 (–2.3, 5.8)
White	63.1 (57.3, 68.9)	67.5 (60.7, 74.4)	64.0 (57.7, 70.3)	64.6 (59.2, 70.0)	63.1 (57.7, 68.5)	57.6 (52.0, 63.1)	55.3 (49.6, 61.0)	54.4 (48.8, 60.1)	–2.8 (–4.0, –1.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

89. Genitourinary incontinence procedures



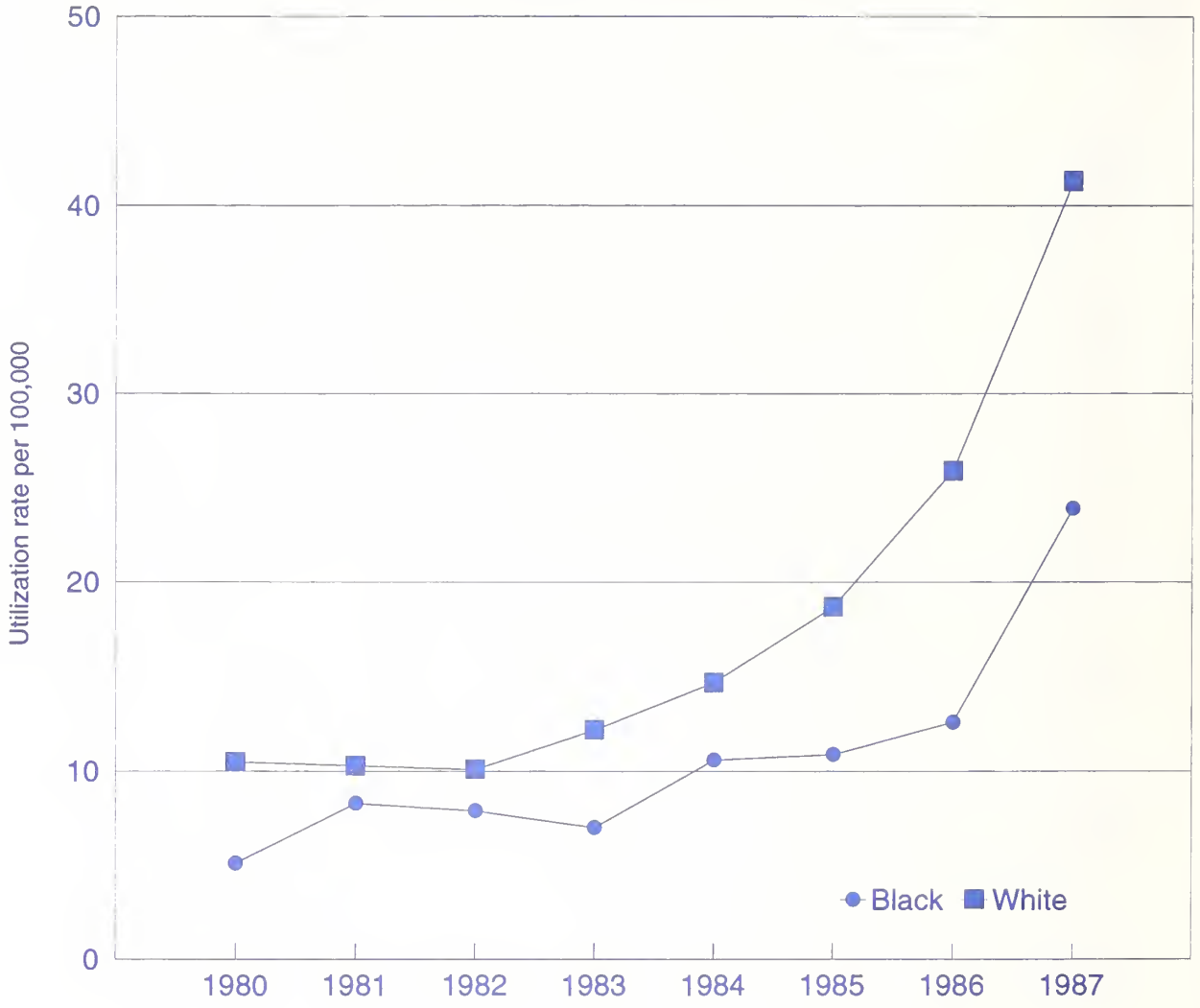
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	28.8 (21.5, 36.1)	32.4 (22.8, 42.0)	25.0 (19.3, 30.6)	22.5 (17.6, 27.5)	25.8 (19.9, 31.8)	22.6 (16.6, 28.5)	19.6 (13.7, 25.5)	17.9 (12.5, 23.3)	−6.9 (−9.4, −4.3)
White	99.3 (90.1, 108.4)	103.3 (94.1, 112.5)	97.2 (89.0, 105.3)	90.2 (83.0, 97.5)	92.2 (84.2, 100.3)	92.0 (84.9, 99.0)	84.7 (77.1, 92.3)	87.8 (80.1, 95.6)	−2.3 (−3.3, −1.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

90. Ureteral catheterization



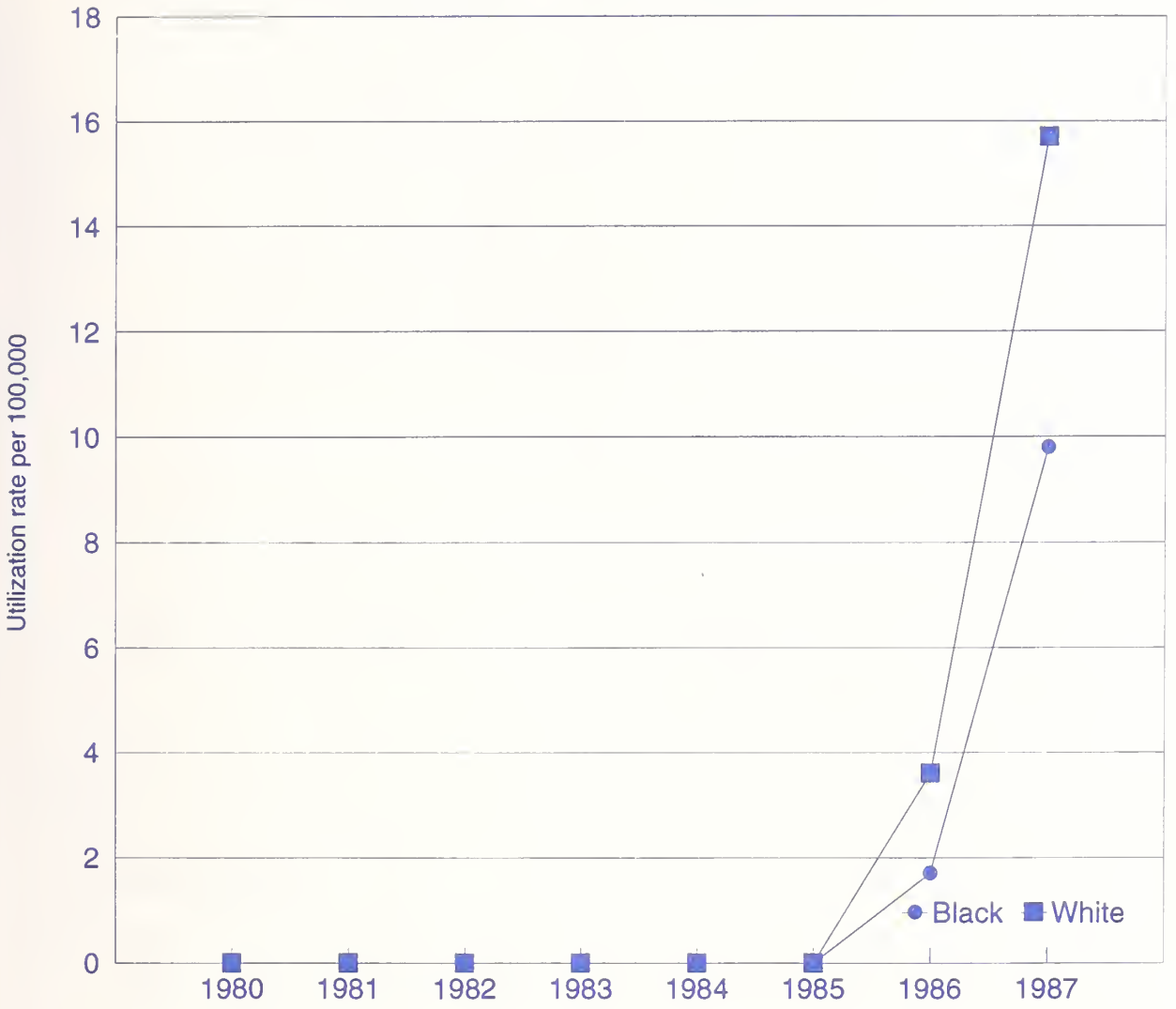
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	5.1 (2.9, 7.4)	8.3 (4.8, 11.7)	7.9 (5.2, 10.5)	7.0 (4.4, 9.6)	10.6 (7.0, 14.2)	10.9 (6.8, 15.0)	12.6 (8.4, 16.8)	23.9 (16.4, 31.4)	18.5 (11.2, 26.4)
White	10.5 (8.6, 12.4)	10.3 (8.3, 12.4)	10.1 (8.1, 12.1)	12.2 (10.2, 14.2)	14.7 (12.0, 17.4)	18.7 (15.9, 21.5)	25.9 (20.8, 31.1)	41.3 (34.8, 47.7)	21.3 (14.1, 29.0)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

91. Extracorporeal lithotripsy, urinary



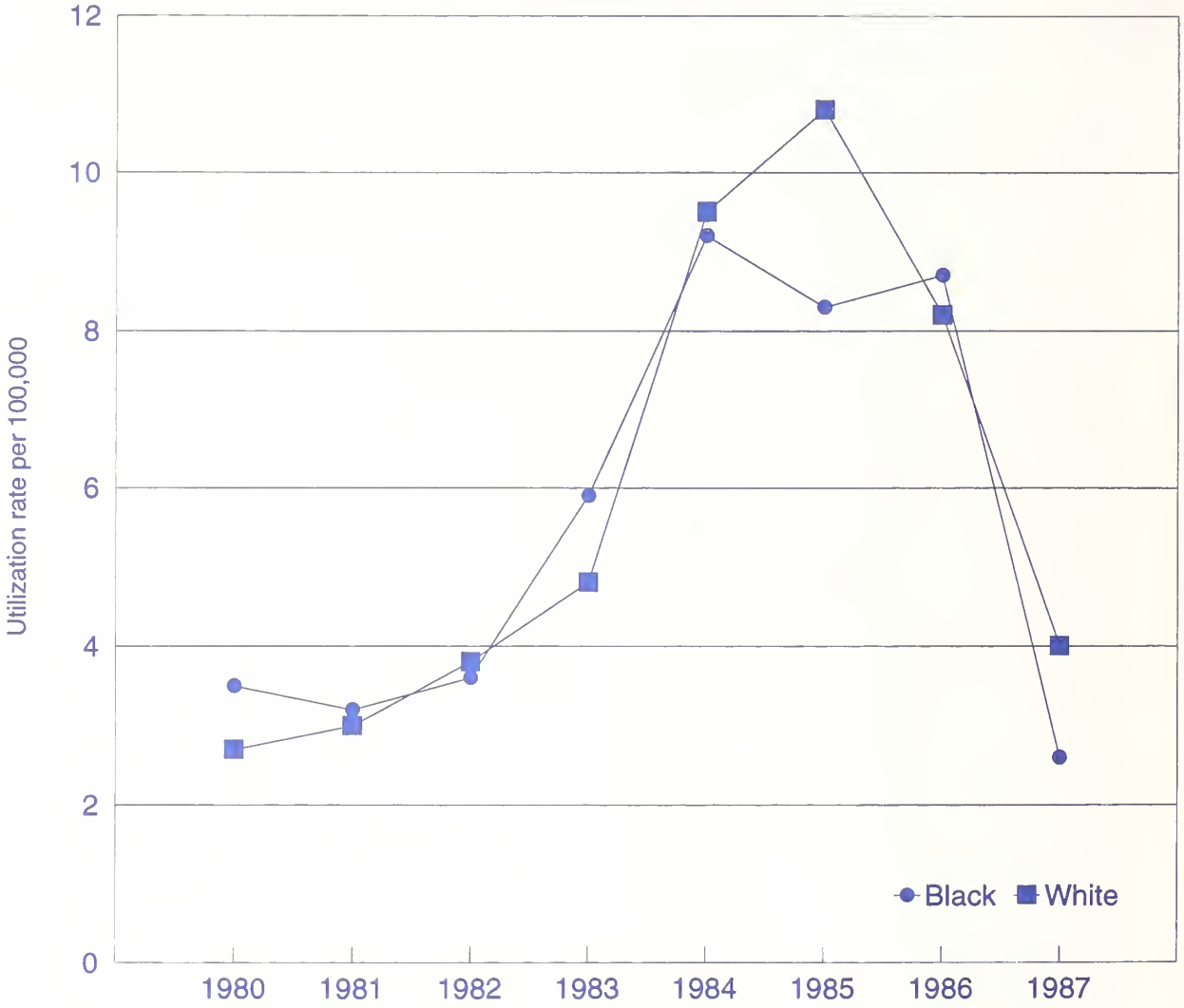
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	0 (—, —)	0 (—, —)	0 (—, —)	0 (—, —)	0 (—, —)	0 (—, —)	1.7 (0.5, 2.9)	9.8 (3.5, 16.0)	— (—, —)
White	0 (—, —)	0 (—, —)	0 (—, —)	0 (—, —)	0 (—, —)	0 (—, —)	3.6 (1.6, 5.6)	15.7 (9.2, 22.1)	— (—, —)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

92. Other nephrotomy



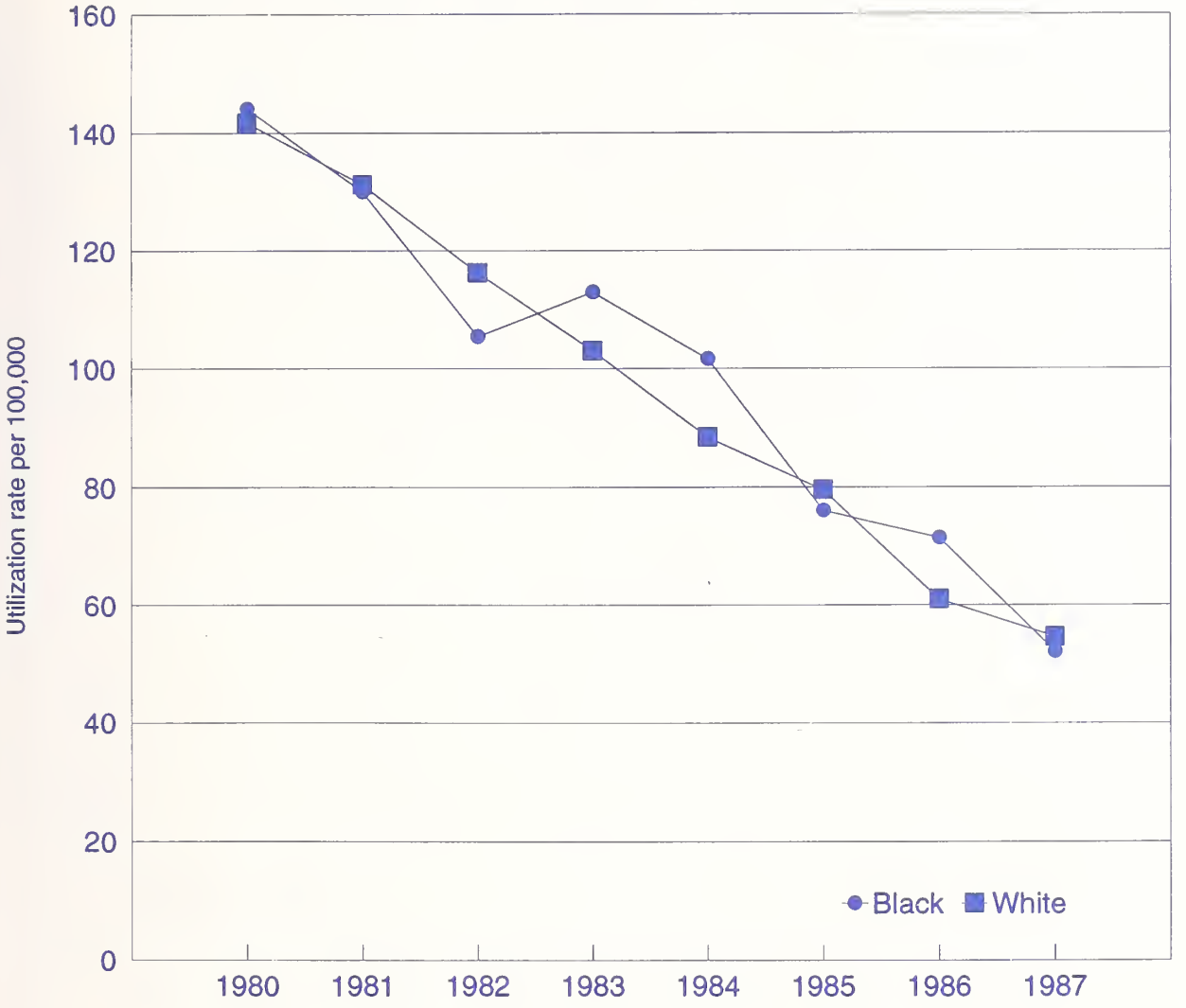
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	3.5 (1.5, 5.5)	3.2 (1.7, 4.7)	3.6 (2.0, 5.3)	5.9 (3.4, 8.5)	9.2 (5.5, 12.8)	8.3 (5.8, 10.7)	8.7 (5.3, 12.0)	2.6 (1.1, 4.0)	6.9 (−8.7, 25.3)
White	2.7 (2.0, 3.4)	3.0 (2.4, 3.6)	3.8 (3.1, 4.5)	4.8 (3.7, 5.9)	9.5 (7.4, 11.6)	10.8 (8.9, 12.7)	8.2 (6.7, 9.8)	4.0 (3.0, 5.0)	15.0 (0.3, 31.8)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

93. Procedures on the urethra



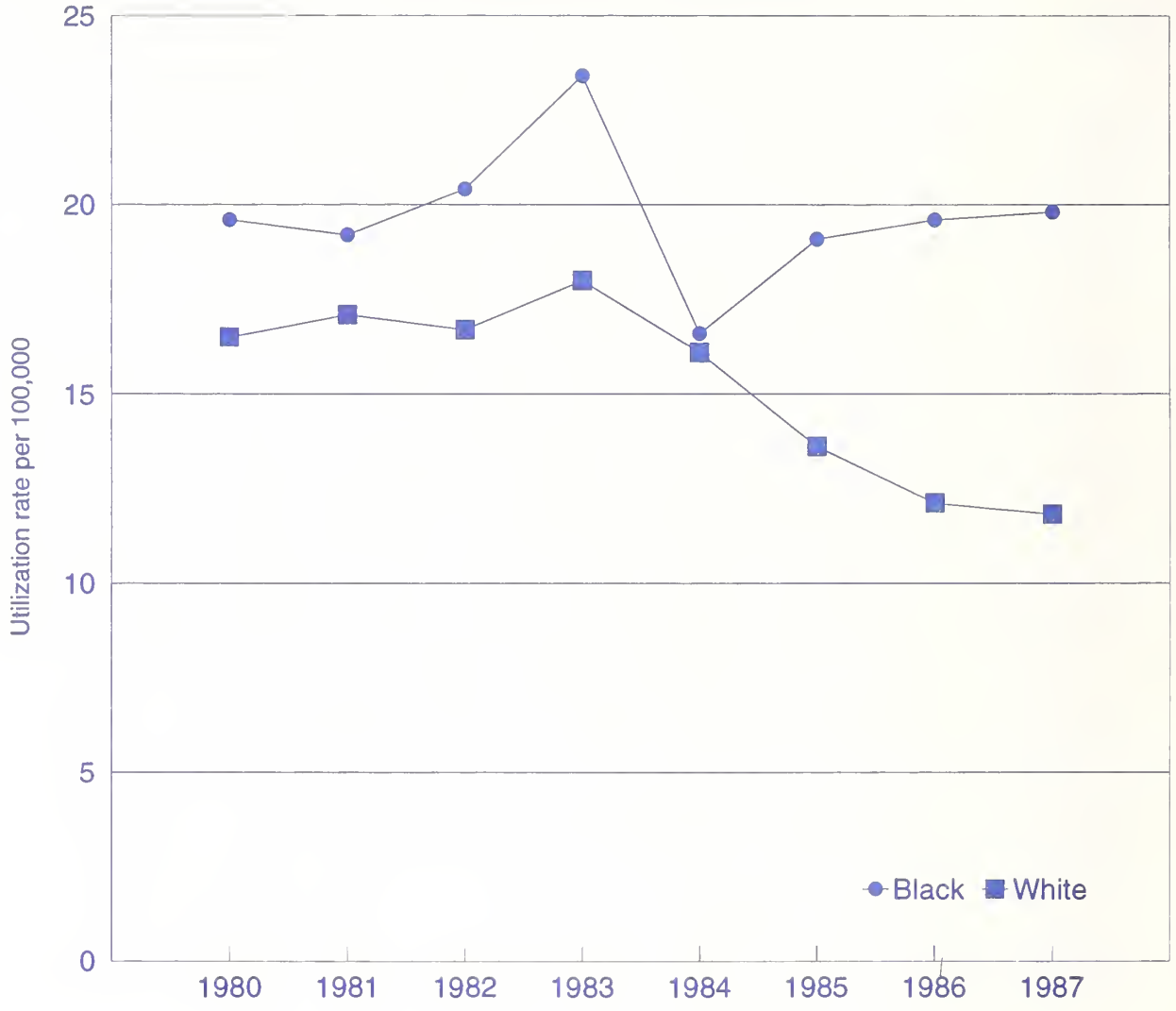
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	144.1 (107.5, 180.8)	130.0 (98.9, 161.1)	105.4 (85.1, 125.7)	112.9 (88.6, 137.2)	101.6 (81.7, 121.6)	76.0 (58.0, 93.9)	71.4 (55.7, 87.1)	52.1 (40.3, 63.9)	−12.5 (−15.1, −9.8)
White	141.7 (123.7, 159.6)	131.2 (113.4, 148.9)	116.2 (99.9, 132.6)	103.0 (89.2, 116.8)	88.4 (76.2, 100.7)	79.5 (63.6, 95.4)	61.0 (53.6, 68.3)	54.6 (47.4, 61.7)	−13.1 (−14.4, −11.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

94. Biopsy of urinary tract



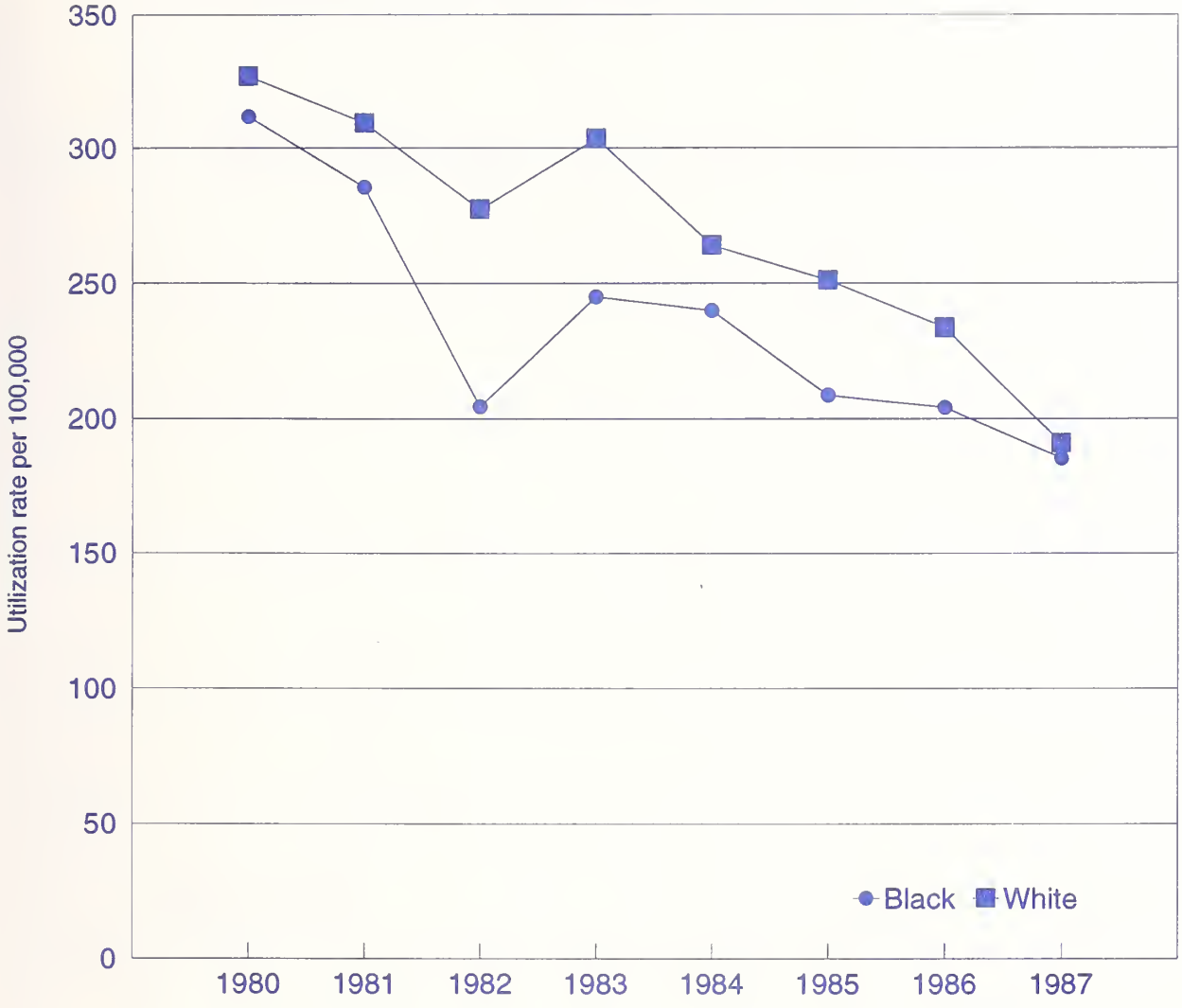
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	19.6	19.2	20.4	23.4	16.6	19.1	19.6	19.8	−0.4
	(14.3,	(13.7,	(13.9,	(17.7,	(11.7,	(11.7,	(13.7,	(13.0,	(−3.5,
	24.8)	24.7)	26.9)	29.0)	21.4)	26.5)	25.5)	26.6)	2.7)
White	16.5	17.1	16.7	18.0	16.1	13.6	12.1	11.8	−5.6
	(14.6,	(14.9,	(14.8,	(15.8,	(14.0,	(11.5,	(10.1,	(9.9,	(−8.2,
	18.5)	19.3)	18.6)	20.1)	18.2)	15.7)	14.1)	13.7)	−2.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

95. Other procedures on the urinary tract



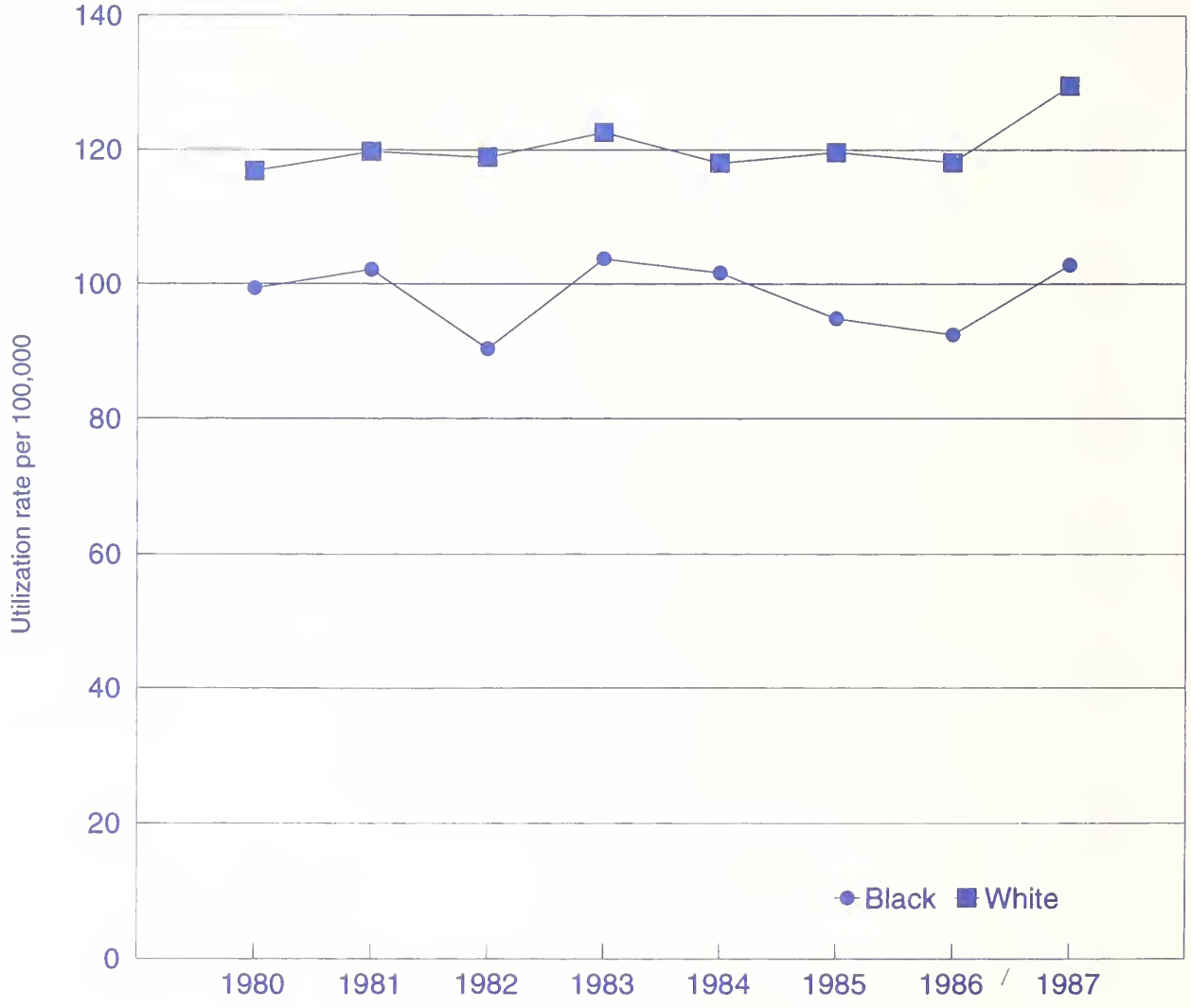
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	311.7 (206.5, 416.9)	285.4 (187.9, 382.9)	204.5 (139.0, 269.9)	244.9 (166.3, 323.5)	239.8 (158.6, 321.1)	208.7 (145.6, 271.8)	204.2 (139.2, 269.2)	185.2 (128.4, 242.1)	−6.1 (−8.9, −3.1)
White	327.0 (265.5, 388.4)	309.3 (254.7, 363.8)	277.2 (228.1, 326.2)	303.5 (240.0, 367.0)	263.9 (217.1, 310.6)	251.0 (206.5, 295.6)	233.6 (190.6, 276.5)	190.8 (153.9, 227.7)	−6.5 (−8.4, −4.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

96. Transurethral prostatectomy (TURP)



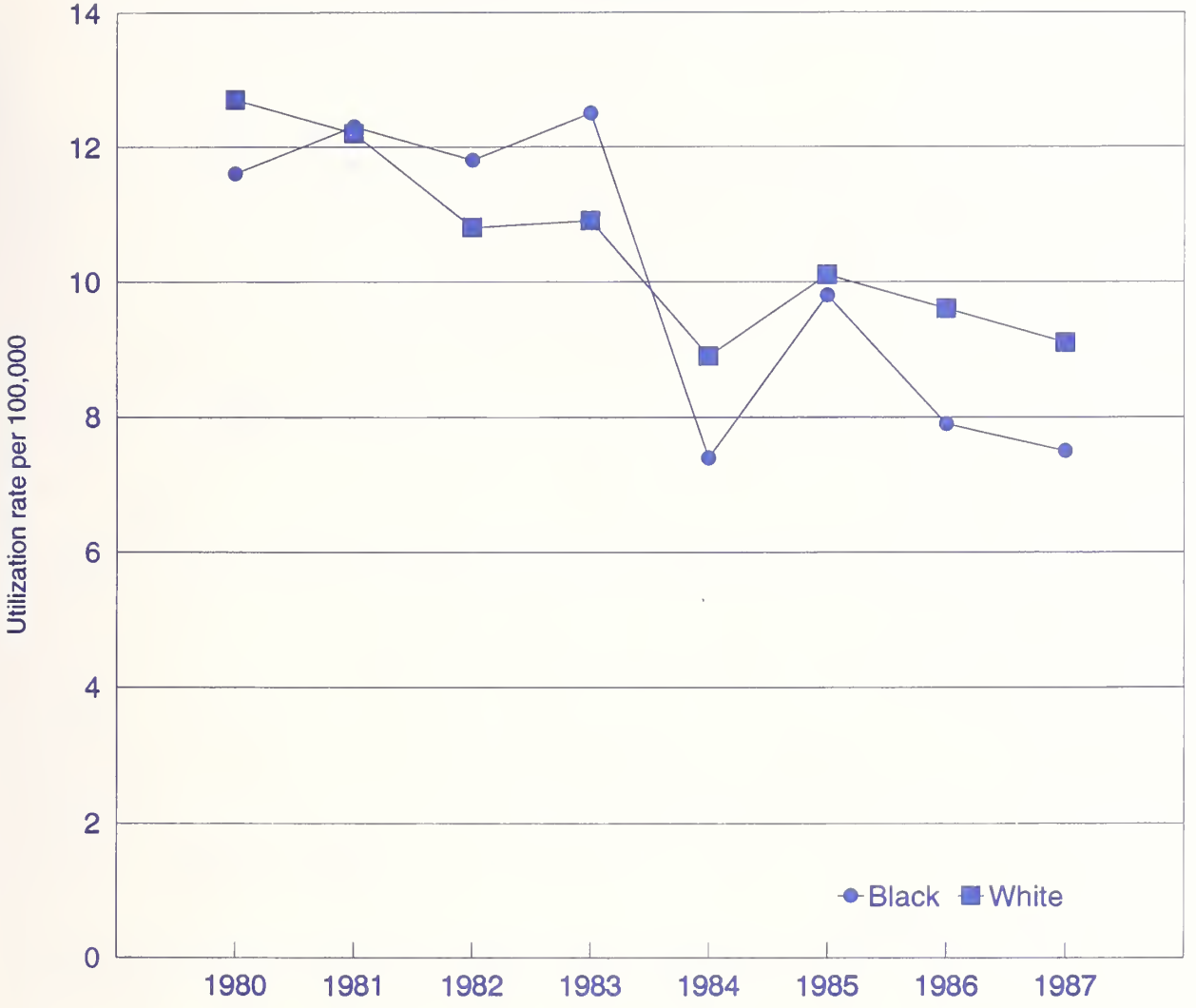
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	99.3 (78.1, 120.6)	102.1 (81.9, 122.4)	90.3 (72.2, 108.4)	103.7 (85.6, 121.8)	101.6 (78.6, 124.6)	94.8 (75.2, 114.4)	92.4 (71.5, 113.2)	102.8 (82.2, 123.4)	−0.2 (−1.9, 1.6)
White	116.8 (106.8, 126.9)	119.7 (108.7, 130.6)	118.9 (109.2, 128.6)	122.6 (113.9, 131.3)	118.0 (109.7, 126.2)	119.6 (110.6, 128.5)	118.1 (107.7, 128.4)	129.5 (119.0, 139.9)	0.8 (−0.1, 1.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

97. Open prostatectomy



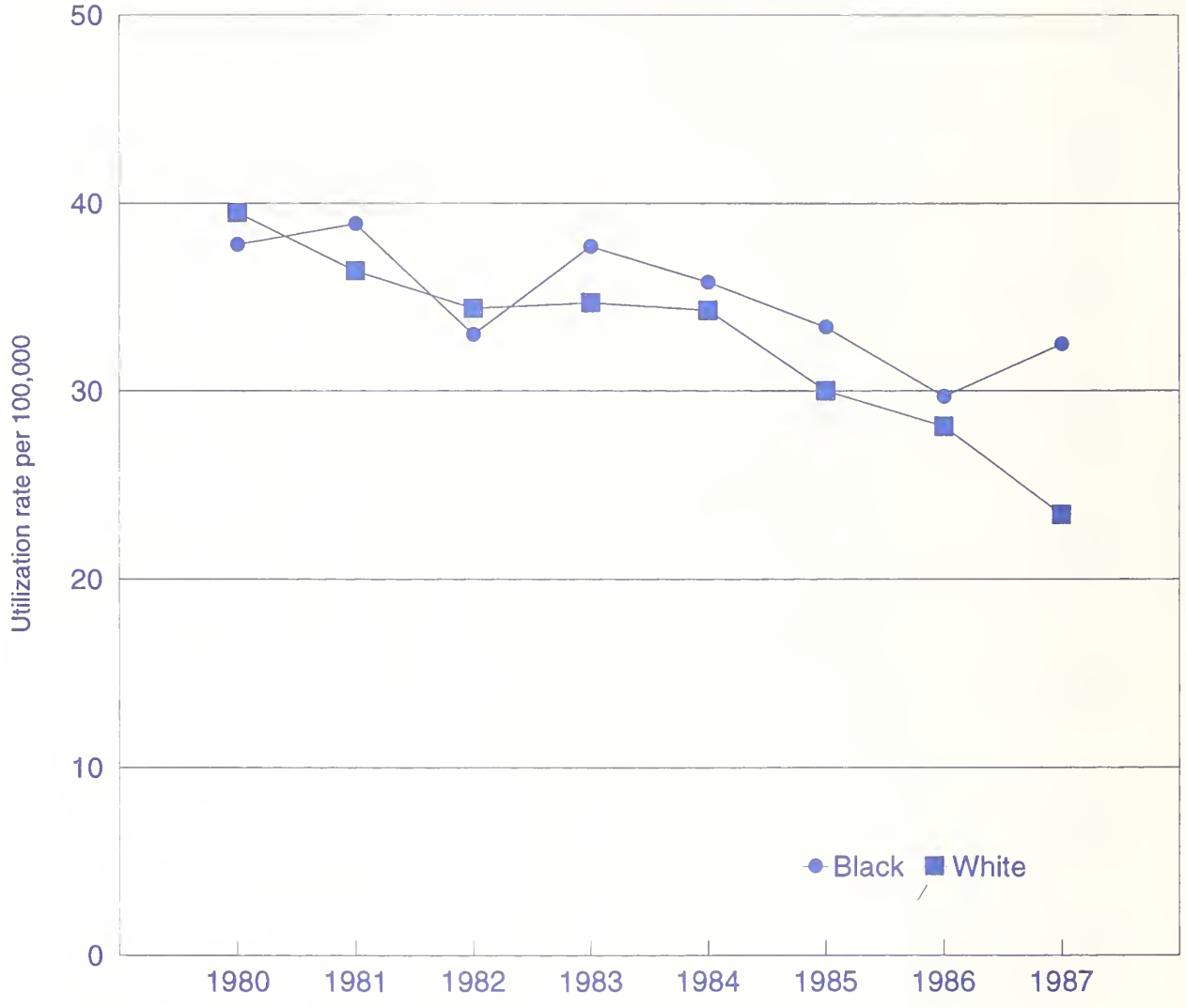
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	11.6 (7.8, 15.4)	12.3 (8.1, 16.5)	11.8 (7.8, 15.9)	12.5 (7.7, 17.2)	7.4 (3.9, 11.0)	9.8 (6.2, 13.4)	7.9 (4.8, 10.9)	7.5 (0.8, 14.1)	−7.4 (−11.3, −3.2)
White	12.7 (10.5, 14.8)	12.2 (9.8, 14.6)	10.8 (8.2, 13.4)	10.9 (8.9, 12.8)	8.9 (7.5, 10.3)	10.1 (7.6, 12.6)	9.6 (7.1, 12.1)	9.1 (7.6, 10.6)	−4.5 (−6.4, −2.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

98. Orchiectomy, orchiopexy



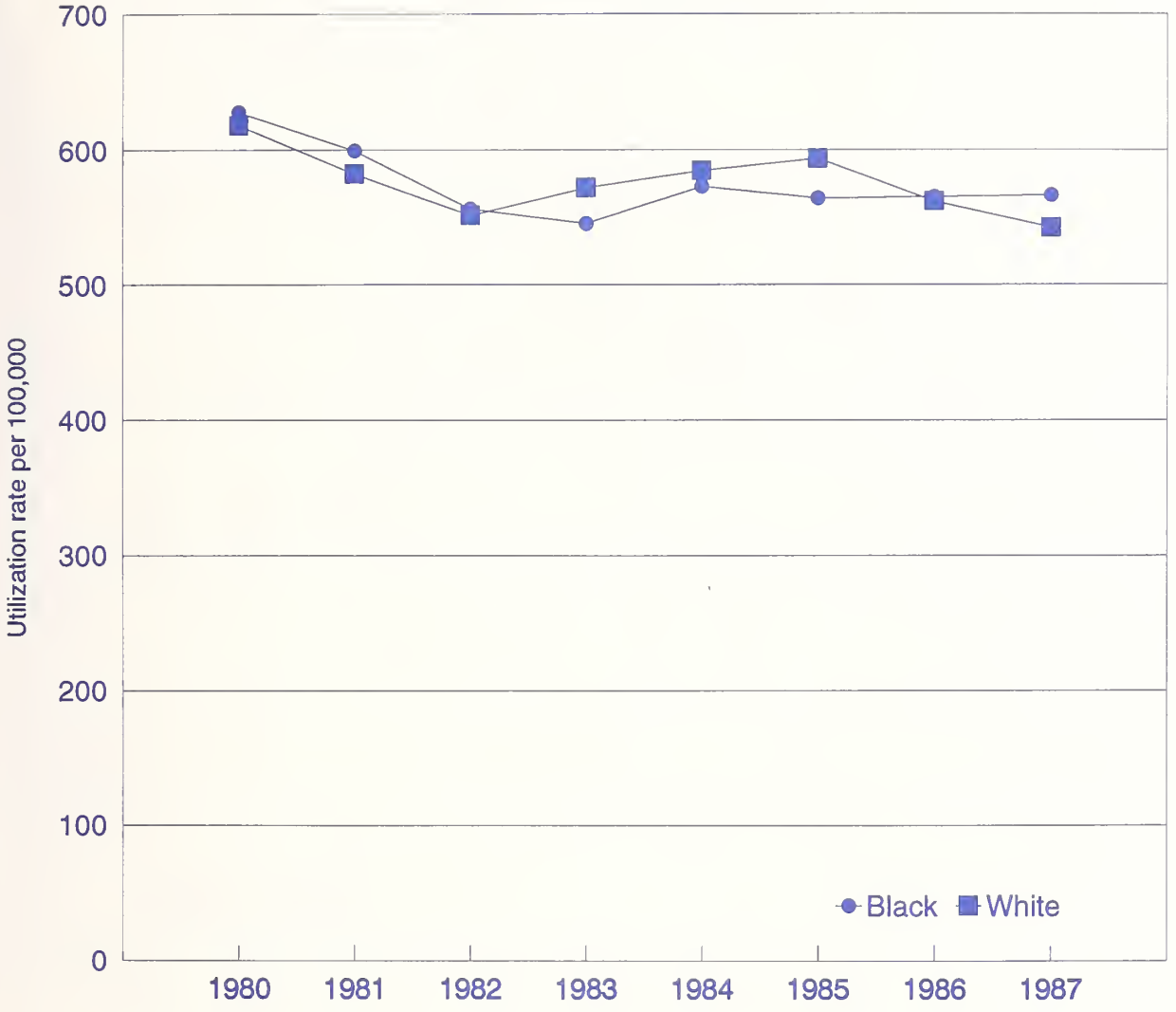
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	37.8	38.9	33.0	37.7	35.8	33.4	29.7	32.5	–2.8
	(30.3,	(31.3,	(26.1,	(31.0,	(28.7,	(26.6,	(22.5,	(24.7,	(–4.7,
	45.2)	46.5)	39.9)	44.4)	42.9)	40.3)	36.9)	40.2)	–0.9)
White	39.5	36.4	34.4	34.7	34.3	30.0	28.1	23.4	–6.2
	(36.1,	(33.0,	(31.1,	(31.8,	(31.5,	(27.5,	(25.4,	(21.2,	(–8.0,
	43.0)	39.8)	37.6)	37.6)	37.1)	32.6)	30.9)	25.6)	–4.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

99. Circumcision



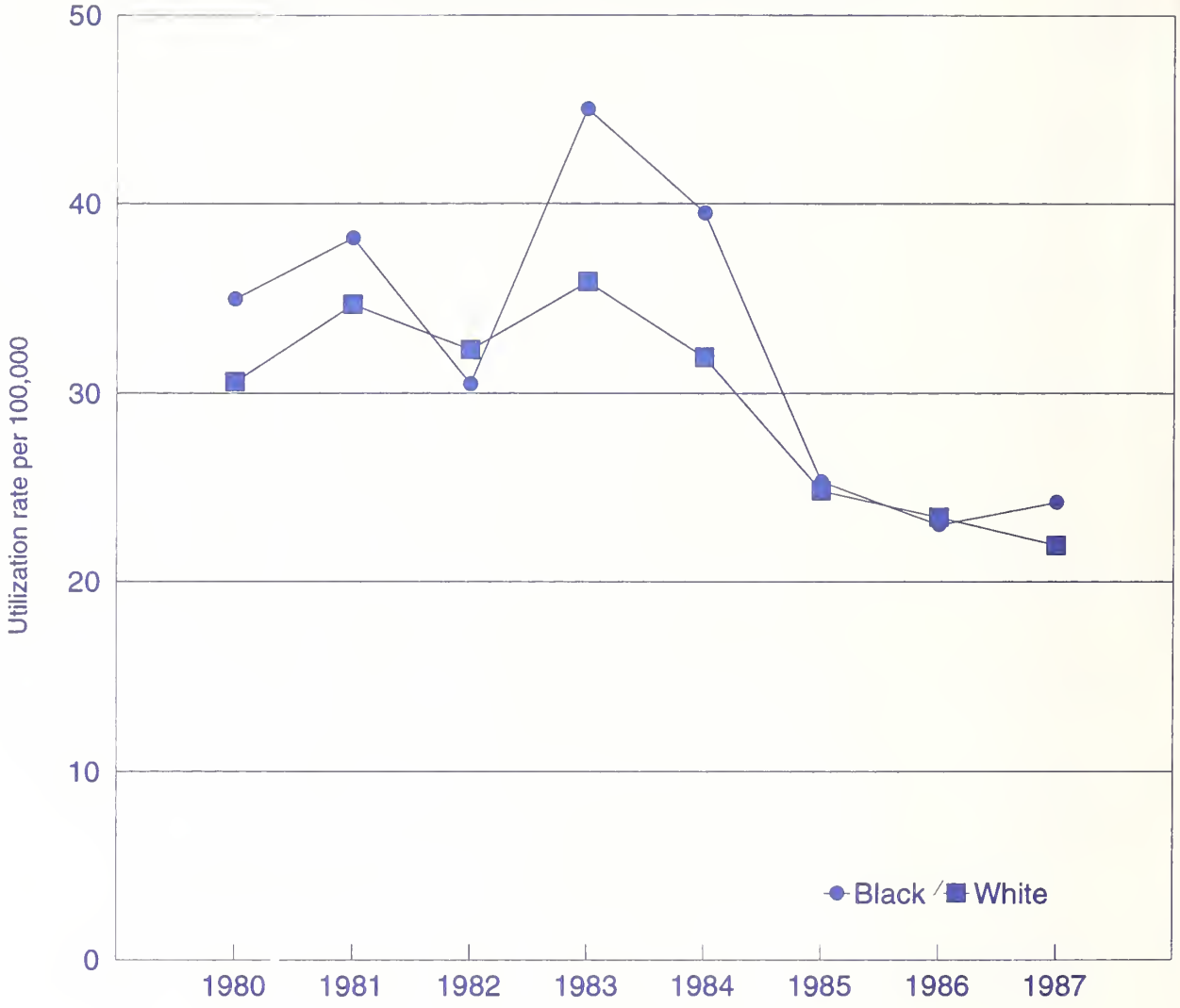
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	627.8 (512.0, 743.6)	599.2 (493.0, 705.3)	556.1 (442.4, 669.8)	545.3 (439.3, 651.2)	572.8 (450.9, 694.7)	564.0 (429.1, 699.0)	565.1 (411.0, 719.1)	566.3 (411.2, 721.3)	−1.1 (−2.3, 0.1)
White	618.1 (553.6, 682.7)	582.0 (521.0, 643.1)	551.3 (489.7, 612.9)	571.8 (519.6, 624.1)	584.5 (527.0, 641.9)	593.5 (533.9, 653.2)	561.7 (506.3, 617.2)	542.3 (490.3, 594.4)	−1.0 (−2.1, 0.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

100. Diagnostic procedures, male genital



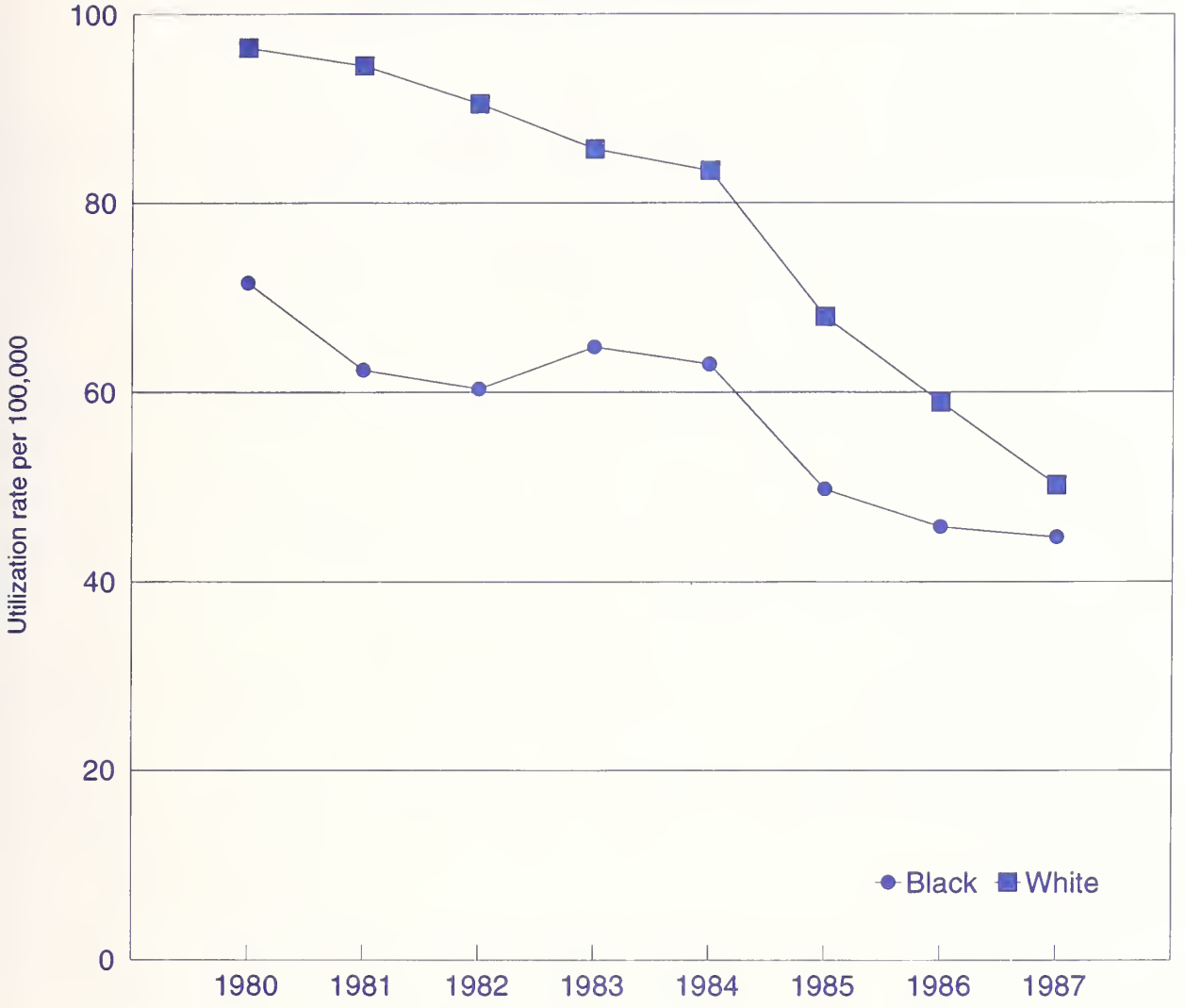
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	35.0 (25.9, 44.2)	38.2 (28.3, 48.0)	30.5 (23.3, 37.6)	45.0 (34.6, 55.5)	39.5 (27.7, 51.2)	25.3 (19.4, 31.2)	23.0 (16.3, 29.6)	24.2 (17.6, 30.8)	−6.7 (−12.2, −0.8)
White	30.6 (27.3, 33.8)	34.7 (31.1, 38.4)	32.3 (29.0, 35.5)	35.9 (32.7, 39.2)	31.9 (28.7, 35.1)	24.8 (21.8, 27.7)	23.4 (20.2, 26.6)	21.9 (19.2, 24.6)	−6.0 (−9.4, −2.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

101. Other procedures, male genital



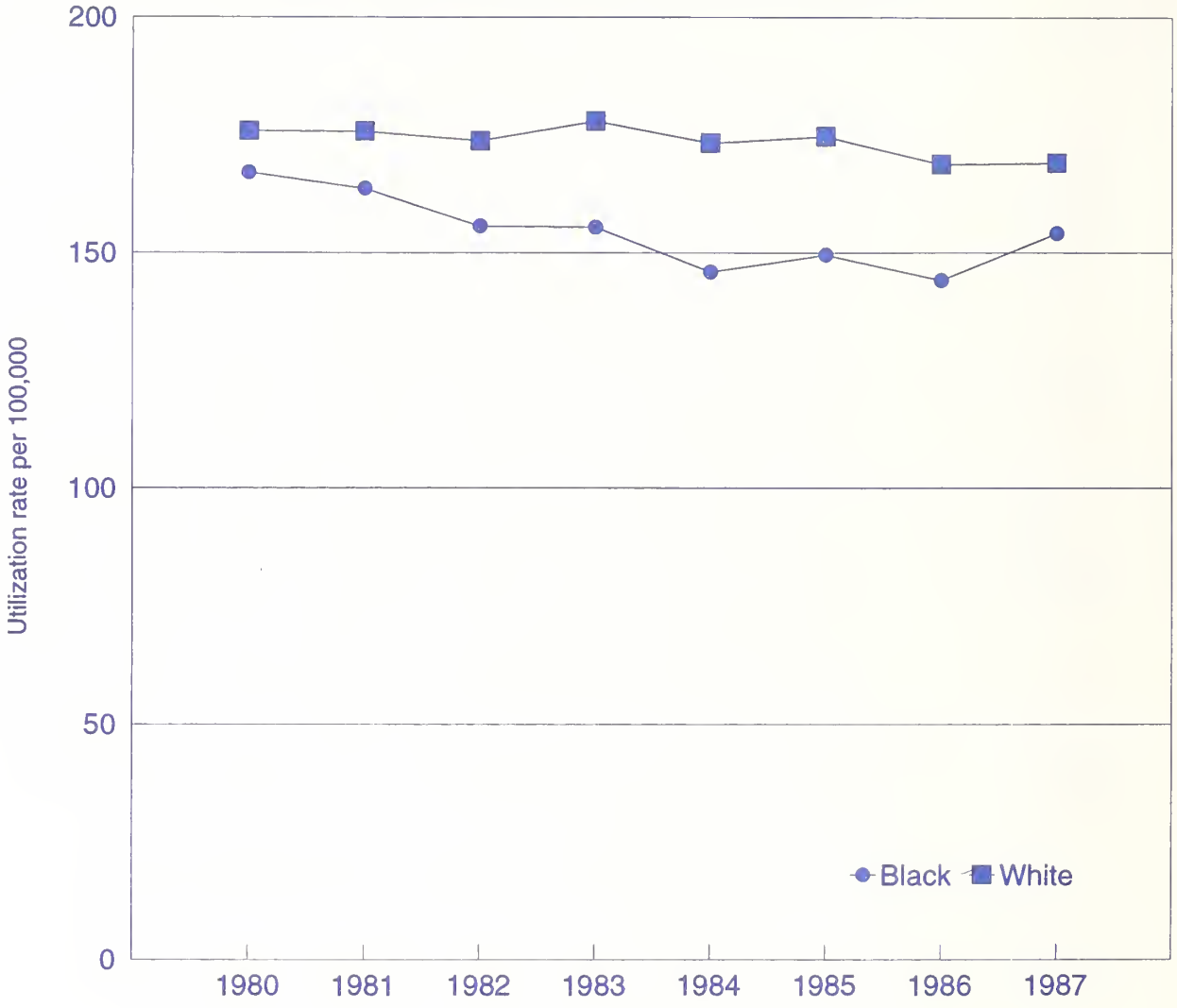
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	71.5 (54.8, 88.2)	62.3 (50.8, 73.9)	60.3 (48.7, 71.9)	64.7 (51.9, 77.5)	62.9 (51.6, 74.1)	49.8 (38.0, 61.6)	45.8 (35.9, 55.7)	44.7 (34.6, 54.8)	−6.3 (−8.5, −4.0)
White	96.4 (88.4, 104.5)	94.5 (86.7, 102.2)	90.5 (82.6, 98.4)	85.7 (79.8, 91.7)	83.4 (77.5, 89.3)	67.9 (62.2, 73.5)	58.9 (53.4, 64.5)	50.2 (45.4, 55.0)	−8.9 (−11.2, −6.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

102. Oophorectomy, unilateral and bilateral



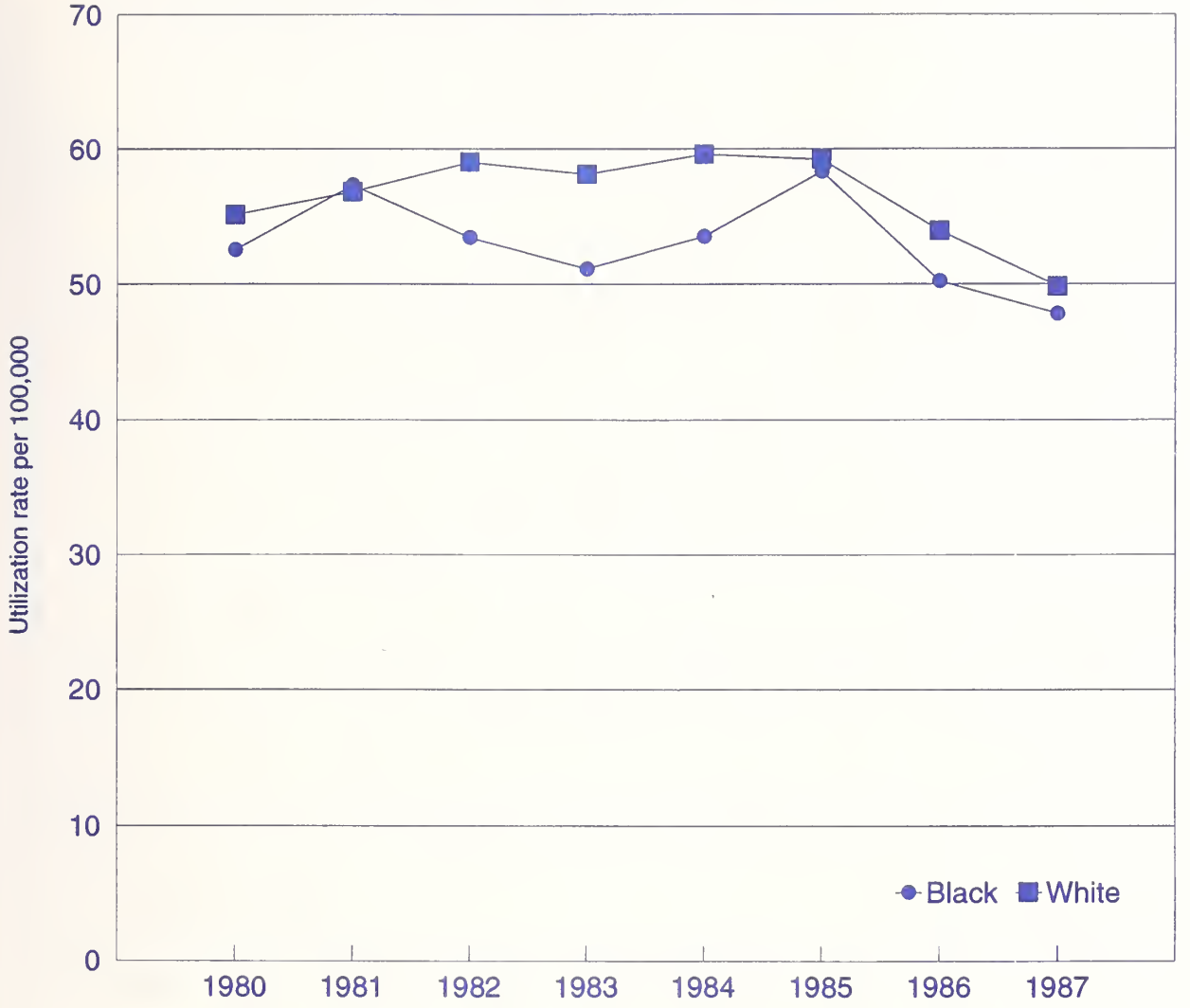
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	167.0 (140.1, 194.0)	163.6 (137.3, 189.8)	155.6 (132.5, 178.7)	155.4 (134.9, 176.0)	145.9 (127.1, 164.7)	149.5 (126.9, 172.2)	144.1 (118.8, 169.4)	154.1 (126.4, 181.8)	–1.6 (–2.7, –0.6)
White	175.8 (162.7, 188.9)	175.7 (161.9, 189.5)	173.7 (159.9, 187.5)	177.9 (165.7, 190.1)	173.2 (161.3, 185.2)	174.6 (161.6, 187.6)	168.7 (154.9, 182.4)	169.0 (154.9, 183.0)	–0.6 (–1.0, –0.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

103. Other operations on ovary



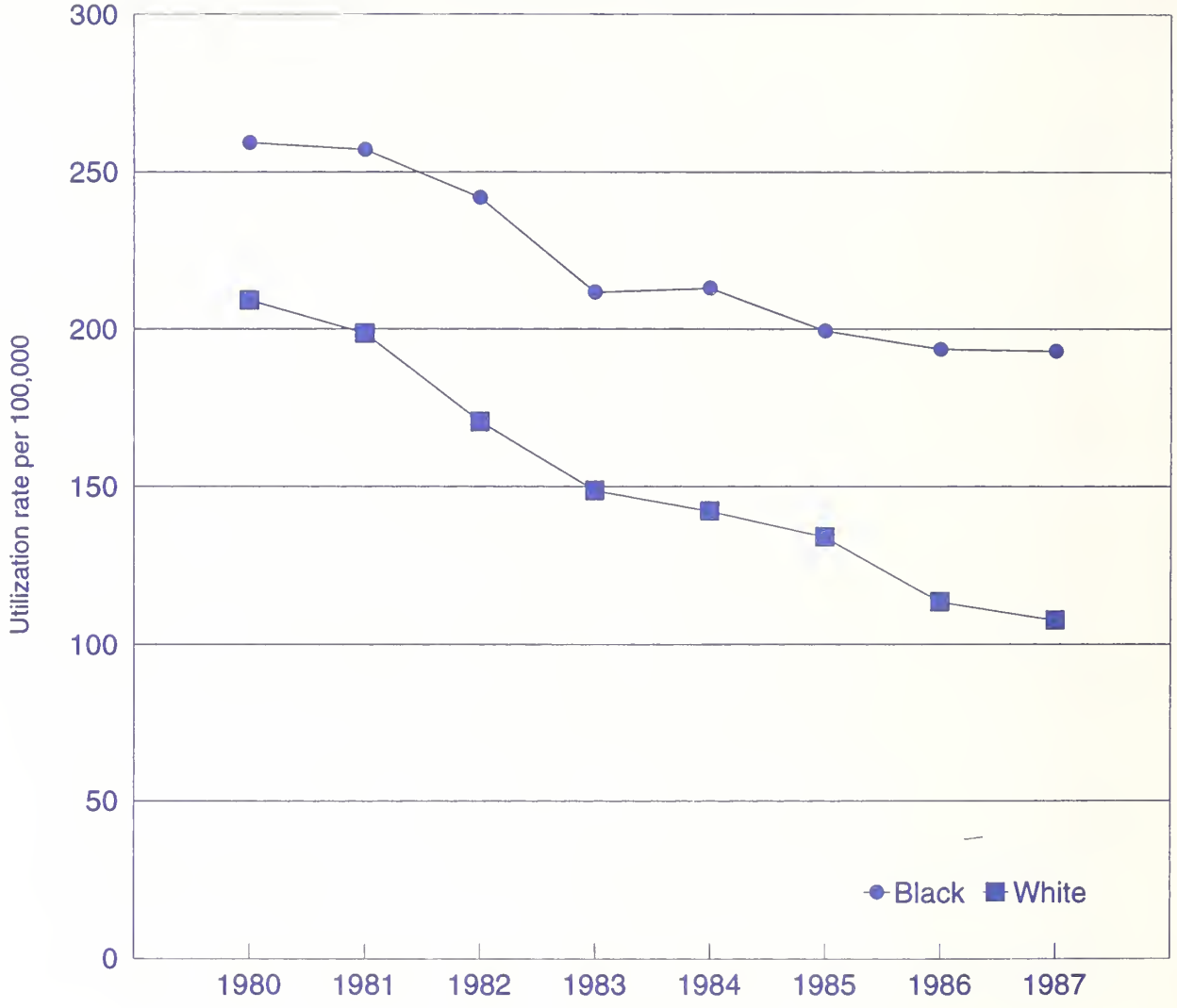
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	52.5 (40.0, 65.0)	57.3 (44.5, 70.1)	53.4 (42.7, 64.2)	51.1 (40.0, 62.2)	53.5 (43.4, 63.5)	58.3 (45.4, 71.3)	50.2 (37.9, 62.6)	47.8 (37.2, 58.5)	−1.2 (−3.1, 0.7)
White	55.1 (49.7, 60.5)	56.8 (51.1, 62.5)	59.0 (53.2, 64.8)	58.1 (52.7, 63.5)	59.6 (53.7, 65.5)	59.2 (52.4, 66.1)	53.9 (47.4, 60.4)	49.8 (42.9, 56.8)	−1.1 (−2.9, 0.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

104. Ligation of fallopian tubes



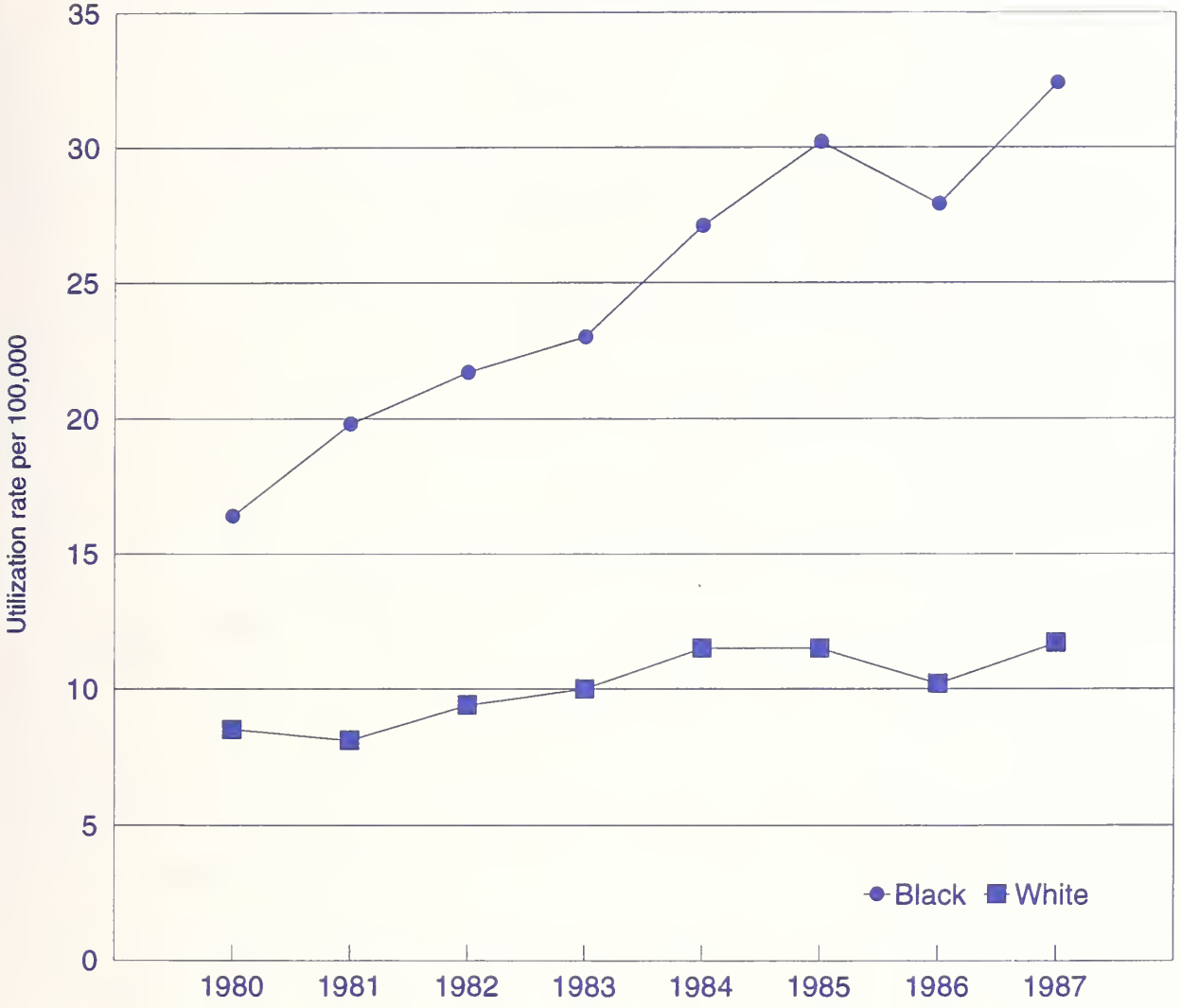
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	259.2 (215.3, 303.2)	257.0 (216.3, 297.6)	241.9 (199.7, 284.2)	211.8 (175.4, 248.3)	213.1 (168.9, 257.2)	199.4 (159.3, 239.5)	193.5 (153.3, 233.8)	192.9 (149.5, 236.3)	–4.7 (–5.7, –3.7)
White	209.2 (187.2, 231.2)	198.6 (178.6, 218.6)	170.4 (152.8, 188.0)	148.6 (133.2, 164.0)	142.1 (127.2, 156.9)	133.9 (117.9, 149.8)	113.4 (101.6, 125.1)	107.6 (95.3, 119.9)	–9.3 (–10.3, –8.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

105. Salpingectomy, removal tubal pregnancy



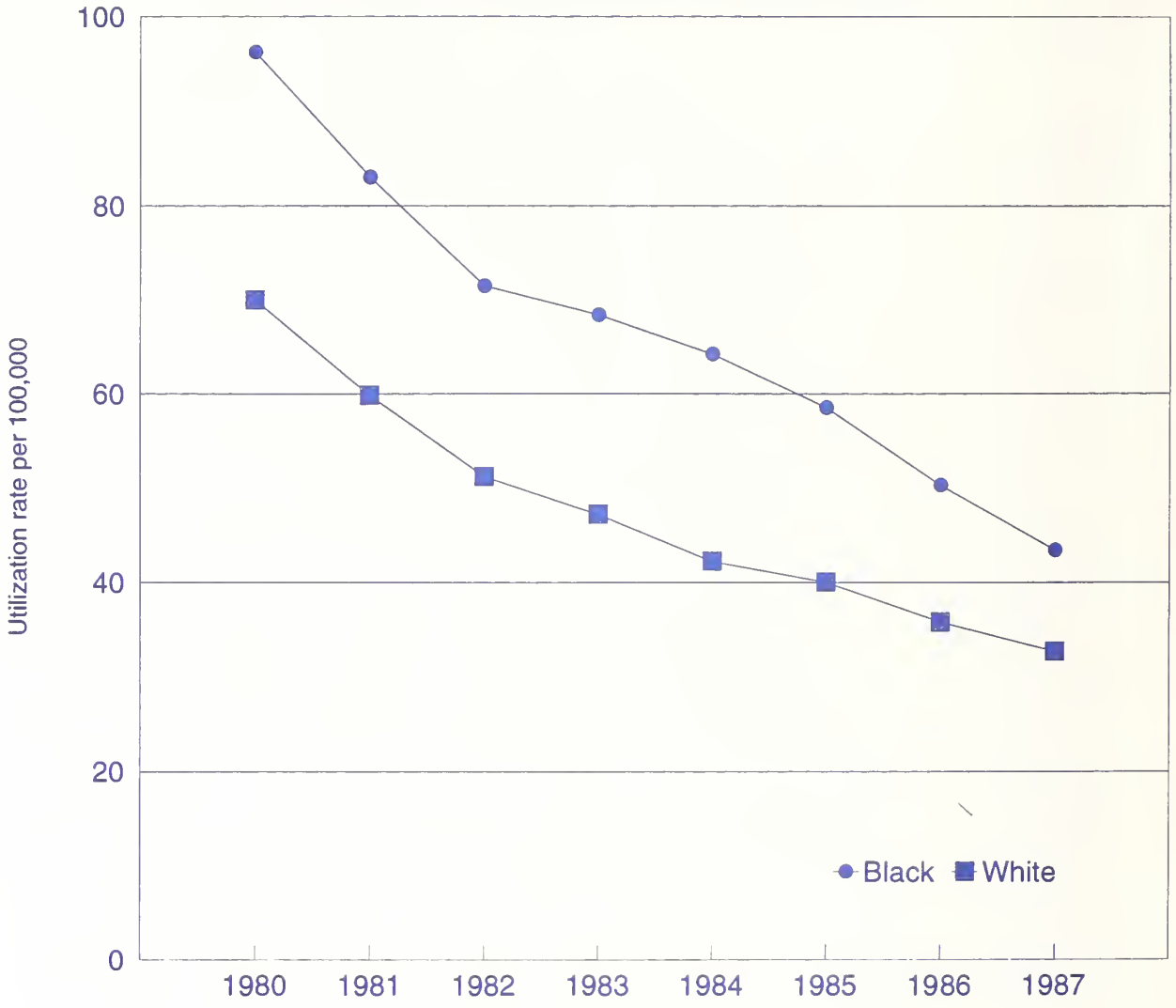
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	16.4 (12.3, 20.5)	19.8 (14.9, 24.7)	21.7 (17.2, 26.1)	23.0 (17.6, 28.3)	27.1 (21.5, 32.6)	30.2 (23.5, 36.9)	27.9 (20.9, 34.9)	32.4 (25.2, 39.7)	9.5 (7.4, 11.7)
White	8.5 (7.2, 9.7)	8.1 (7.1, 9.2)	9.4 (8.2, 10.6)	10.0 (8.8, 11.2)	11.5 (10.1, 12.8)	11.5 (10.2, 12.8)	10.2 (9.0, 11.4)	11.7 (10.4, 13.1)	5.0 (2.6, 7.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

106. Other procedures on fallopian tubes



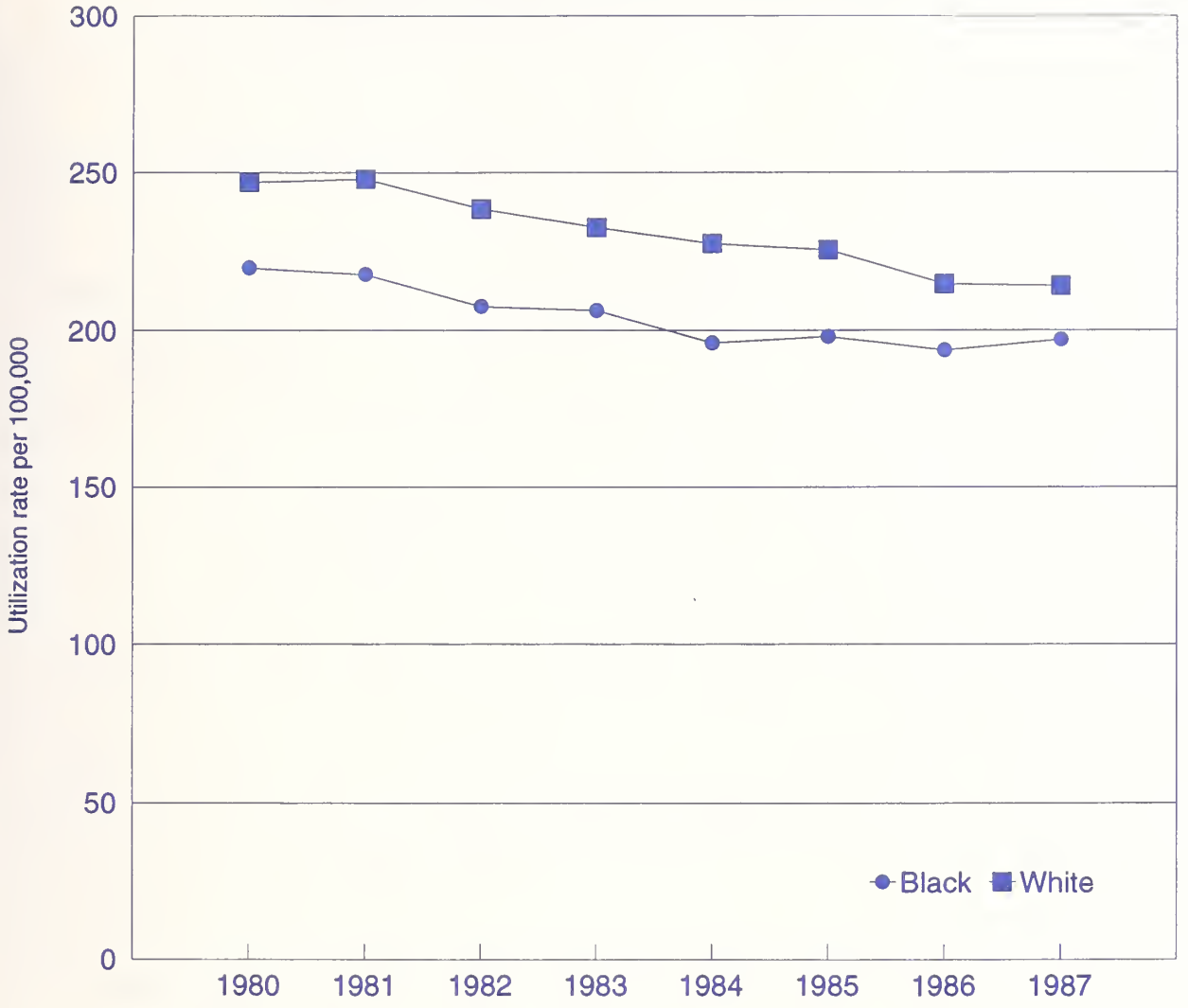
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	96.2 (74.2, 118.3)	83.0 (63.3, 102.6)	71.5 (56.7, 86.3)	68.4 (54.6, 82.1)	64.2 (50.8, 77.6)	58.5 (46.0, 71.0)	50.3 (38.8, 61.7)	43.4 (33.4, 53.3)	–9.9 (–11.0, –8.7)
White	70.0 (58.9, 81.0)	59.8 (52.1, 67.5)	51.2 (45.6, 56.9)	47.2 (42.1, 52.3)	42.2 (37.6, 46.9)	40.0 (35.2, 44.8)	35.8 (31.8, 39.8)	32.7 (28.8, 36.5)	–9.9 (–10.9, –8.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

107. Hysterectomy, abdominal and vaginal



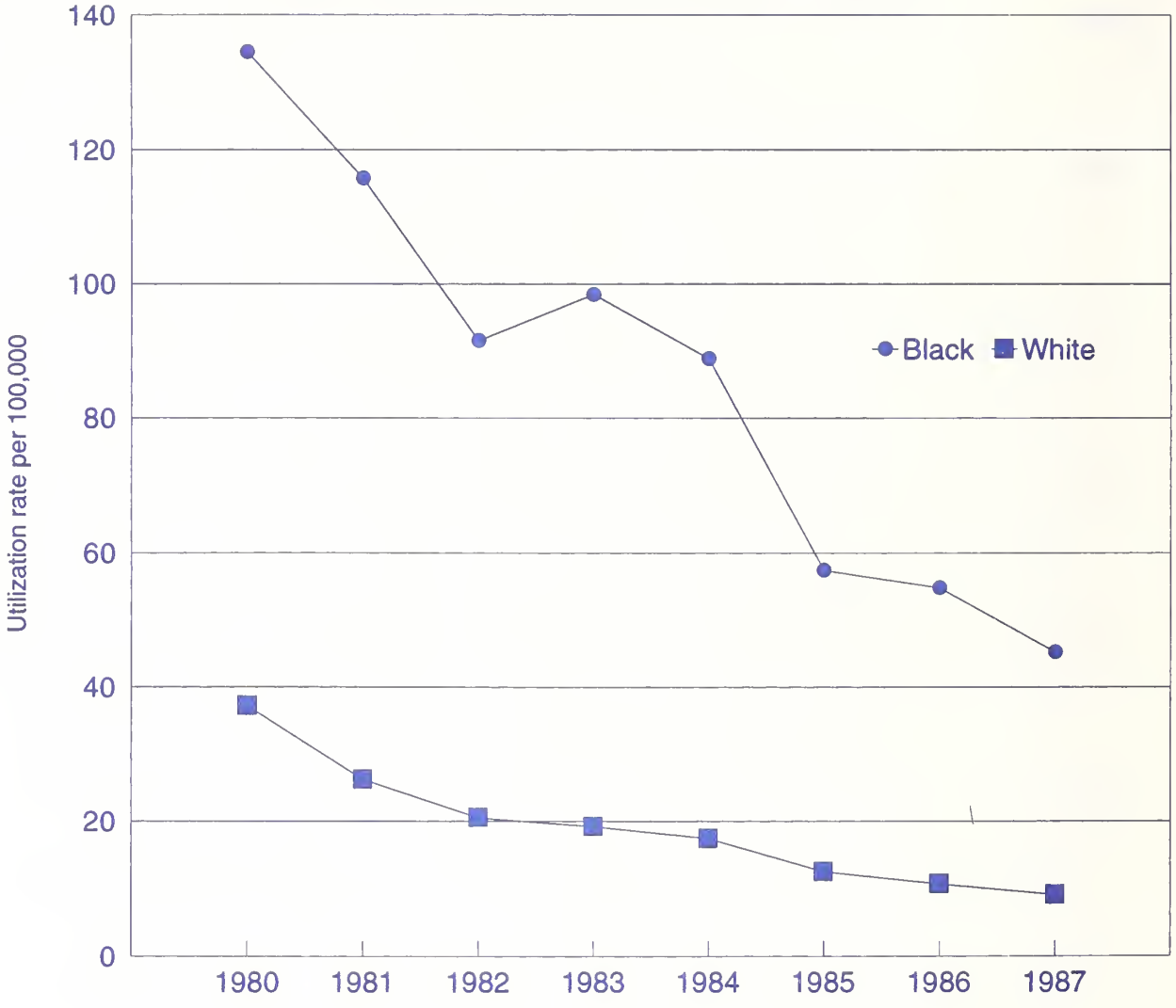
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	219.7 (186.4, 253.1)	217.7 (182.9, 252.6)	207.5 (175.5, 239.6)	206.3 (178.2, 234.4)	196.0 (169.9, 222.0)	198.0 (166.6, 229.3)	193.7 (158.0, 229.5)	197.0 (158.7, 235.3)	−1.8 (−2.4, −1.2)
White	246.9 (227.2, 266.6)	247.9 (227.9, 267.9)	238.4 (218.7, 258.1)	232.5 (216.6, 248.5)	227.4 (211.6, 243.2)	225.4 (209.1, 241.6)	214.6 (198.4, 230.7)	214.0 (197.3, 230.8)	−2.3 (−2.6, −1.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

108. Abortion (termination of pregnancy)



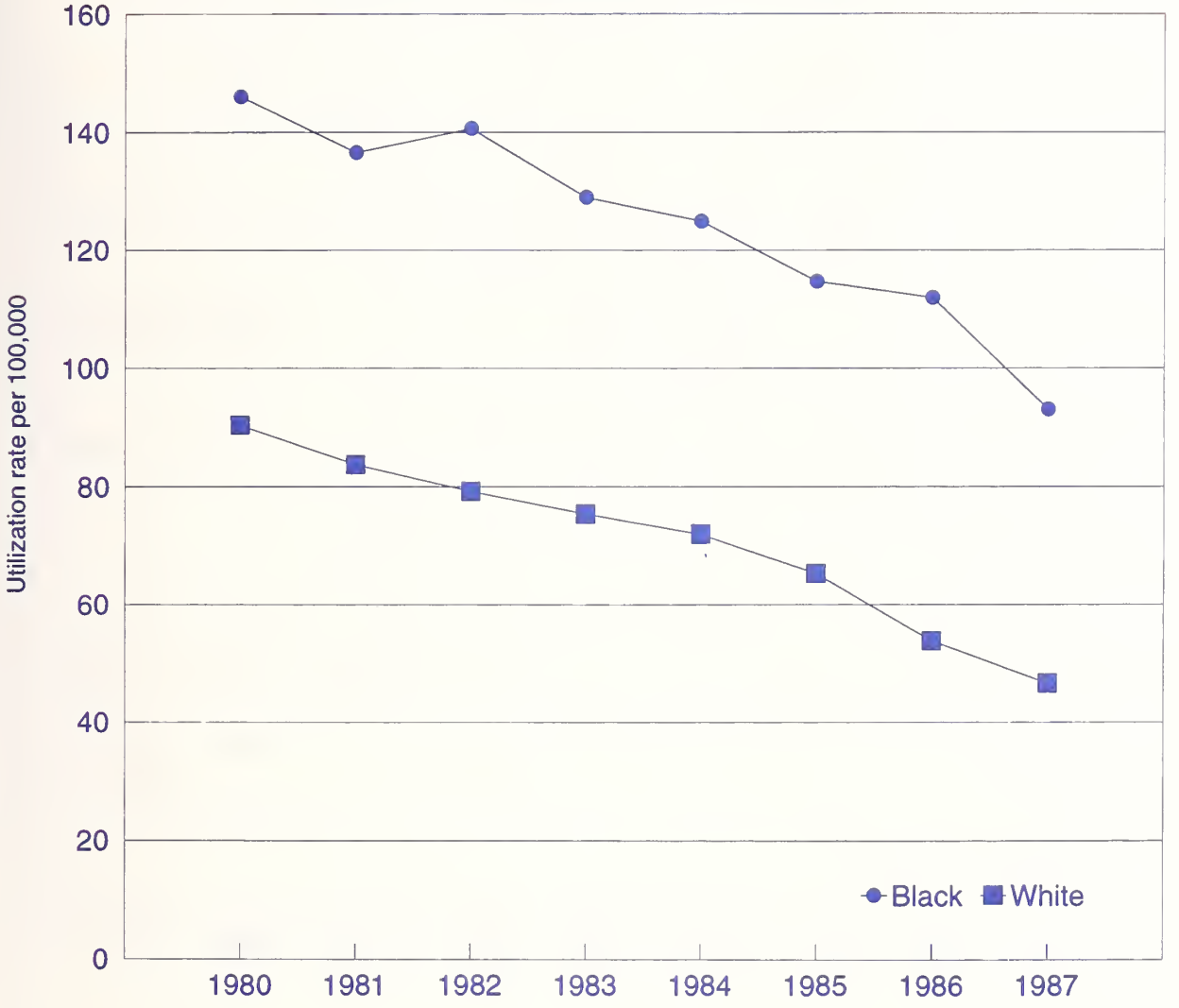
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	134.5	115.7	91.5	98.4	88.8	57.4	54.8	45.2	−14.2
	(81.5,	(65.6,	(50.3,	(50.3,	(42.1,	(26.1,	(23.2,	(15.3,	(−17.0,
	187.5)	165.8)	132.7)	146.5)	135.5)	88.6)	86.4)	75.0)	−11.3)
White	37.2	26.2	20.5	19.2	17.4	12.5	10.7	9.1	−17.3
	(27.6,	(21.1,	(16.4,	(13.7,	(13.1,	(9.4,	(8.0,	(6.7,	(−19.3,
	46.8)	31.3)	24.6)	24.7)	21.7)	15.6)	13.3)	11.5)	−15.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

109. Dilation and curettage (D&C), aspiration after delivery or abortion



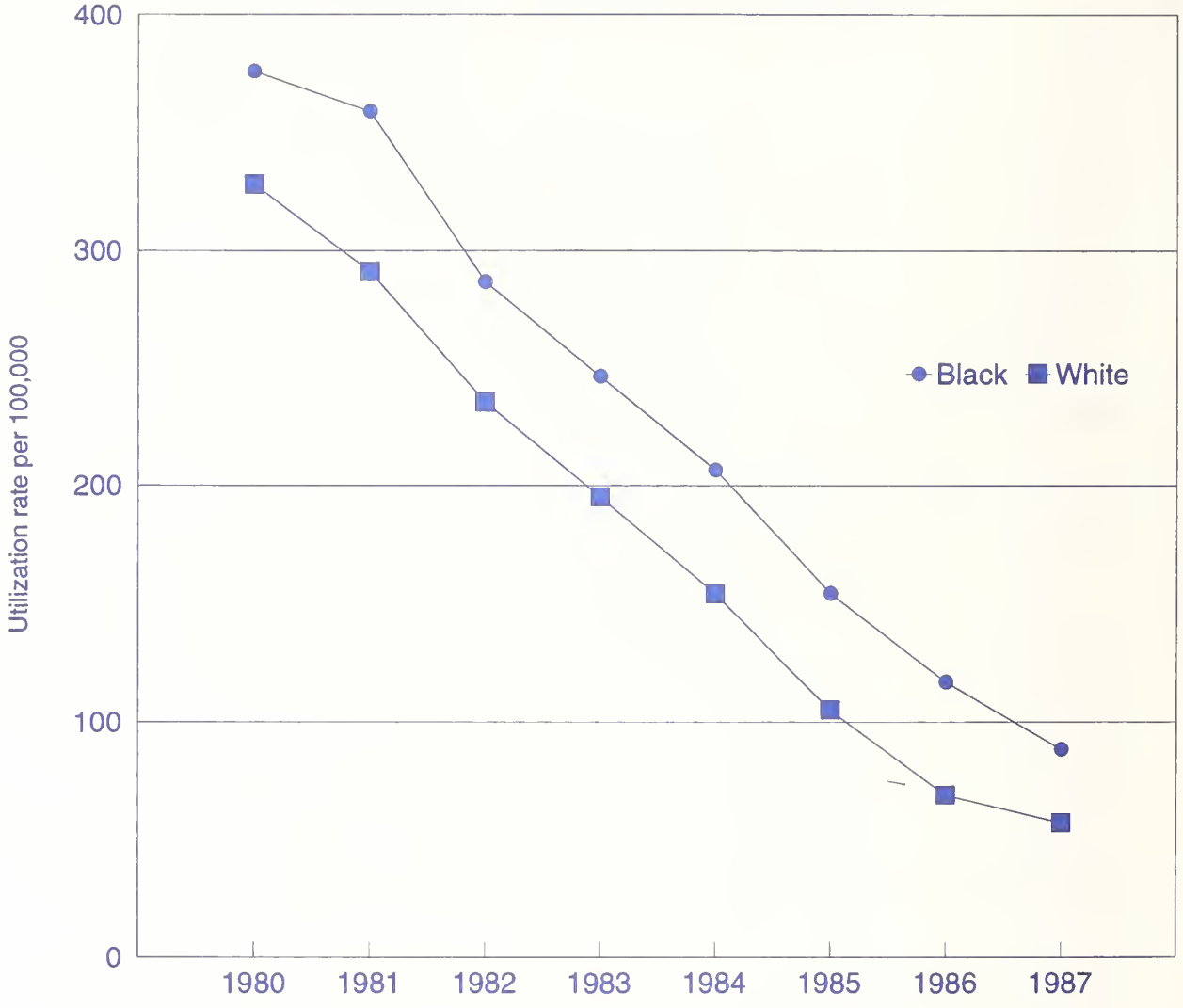
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	146.0 (114.1, 178.0)	136.5 (110.8, 162.2)	140.6 (110.5, 170.8)	128.9 (101.7, 156.1)	124.9 (96.4, 153.3)	114.7 (81.9, 147.6)	111.9 (82.5, 141.2)	93.0 (59.9, 126.2)	–5.5 (–7.0, –4.1)
White	90.3 (81.9, 98.7)	83.7 (76.2, 91.3)	79.2 (72.0, 86.3)	75.4 (68.2, 82.5)	72.0 (65.5, 78.4)	65.3 (58.5, 72.0)	53.8 (47.6, 60.1)	46.6 (40.0, 53.1)	–8.5 (–10.3, –6.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

110. Diagnostic dilation and curettage (D&C)



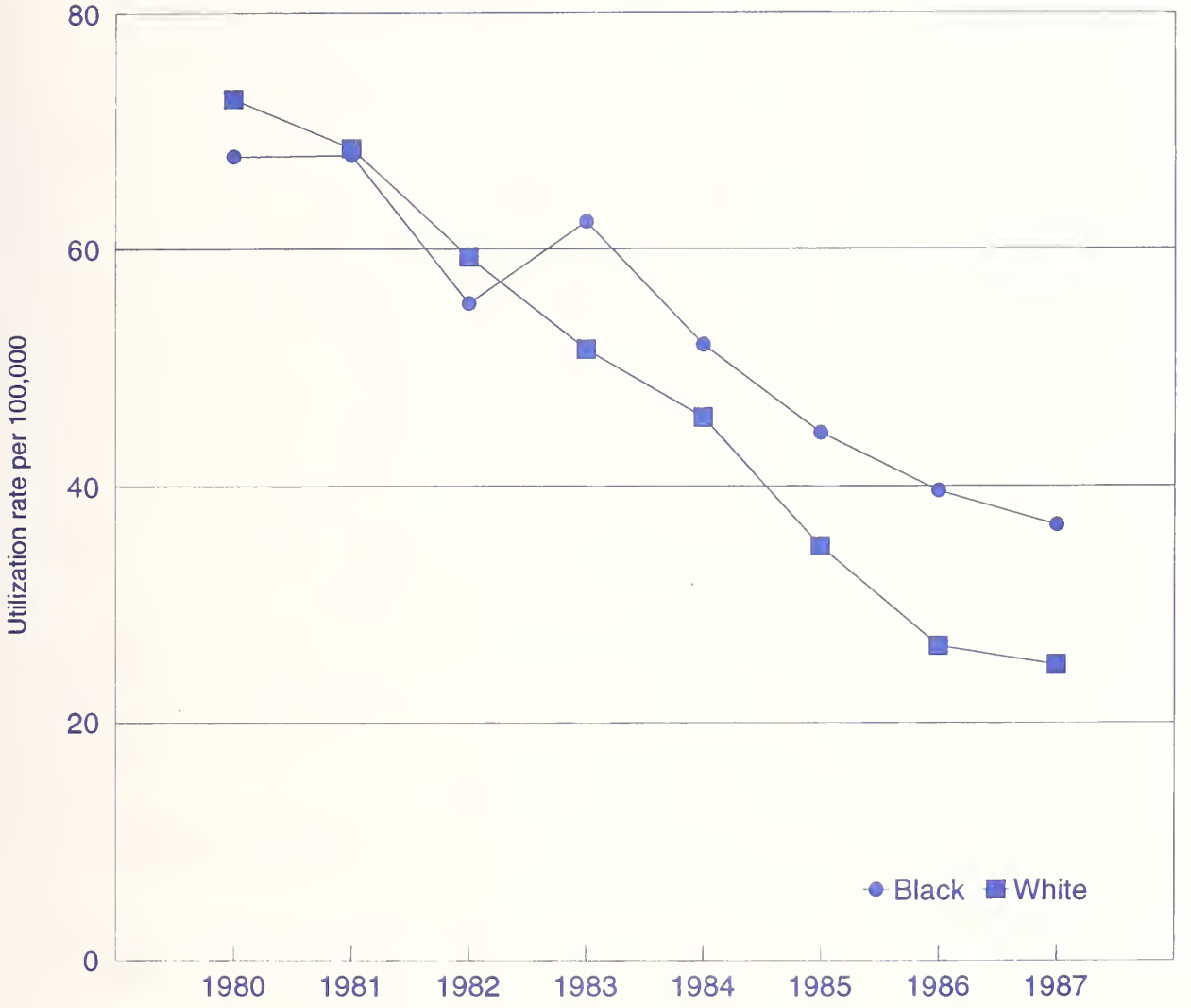
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	375.8 (295.3, 456.3)	358.7 (283.9, 433.5)	286.7 (231.8, 341.7)	246.5 (203.7, 289.3)	206.6 (164.2, 248.9)	154.2 (104.9, 203.6)	116.9 (78.5, 155.2)	88.4 (65.5, 111.4)	−19.1 (−21.3, −16.8)
White	327.9 (303.0, 352.8)	291.0 (269.2, 312.8)	235.5 (217.5, 253.4)	195.0 (177.2, 212.8)	154.0 (136.8, 171.2)	105.1 (92.2, 118.1)	68.9 (59.7, 78.1)	57.0 (47.9, 66.1)	−23.1 (−25.8, −20.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

111. Other excision of cervix and uterus



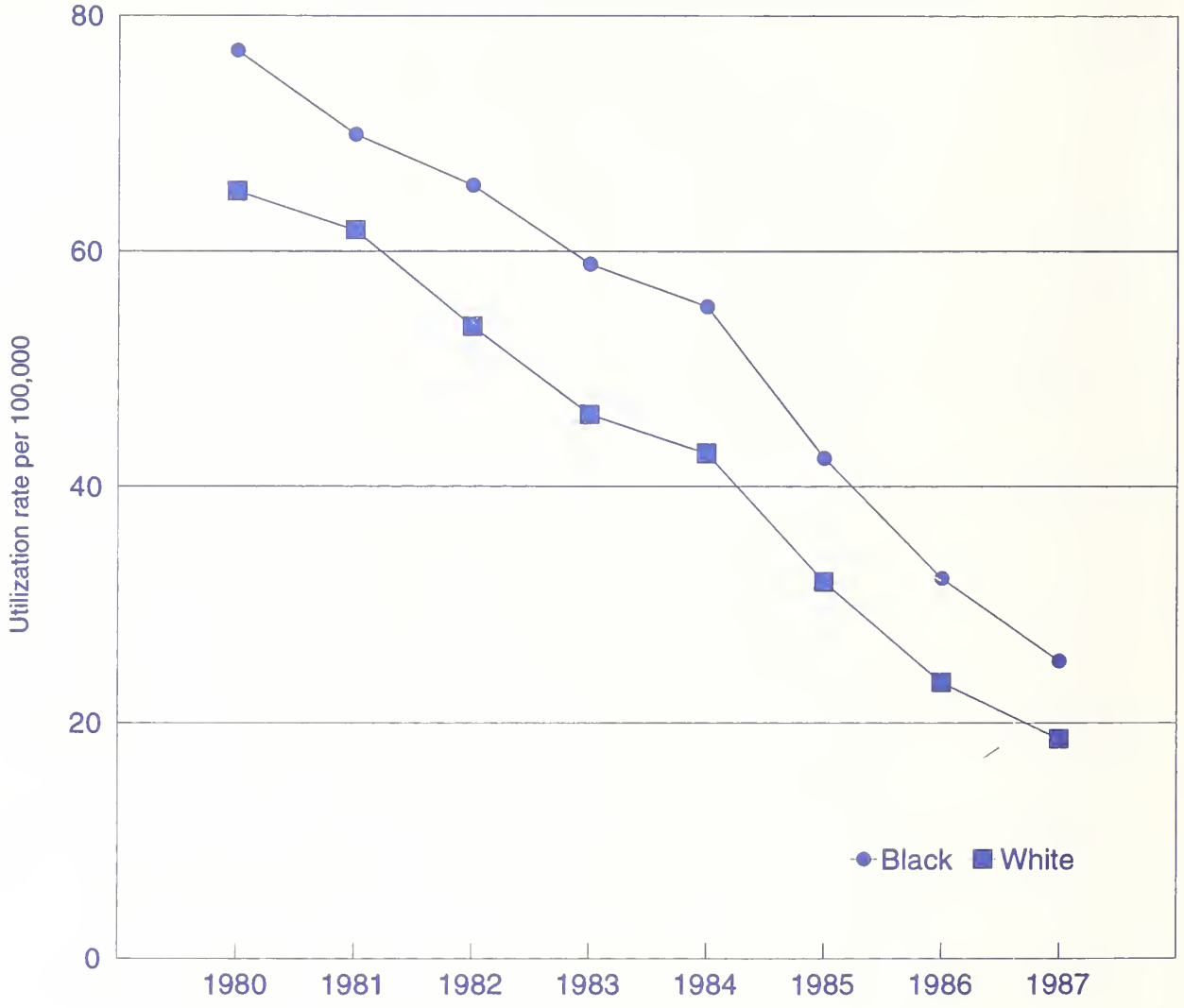
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	67.8 (53.4, 82.1)	67.9 (57.0, 78.9)	55.4 (45.1, 65.7)	62.3 (51.4, 73.1)	51.9 (39.8, 64.1)	44.5 (35.6, 53.3)	39.6 (29.9, 49.4)	36.7 (26.1, 47.3)	−8.9 (−10.9, −6.8)
White	72.7 (65.1, 80.2)	68.5 (61.9, 75.2)	59.3 (53.4, 65.2)	51.5 (46.0, 57.0)	45.8 (41.1, 50.6)	34.9 (30.8, 39.0)	26.5 (23.0, 30.0)	24.9 (20.4, 29.5)	−15.3 (−17.3, −13.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

112. Other diagnostic procedures, female organs



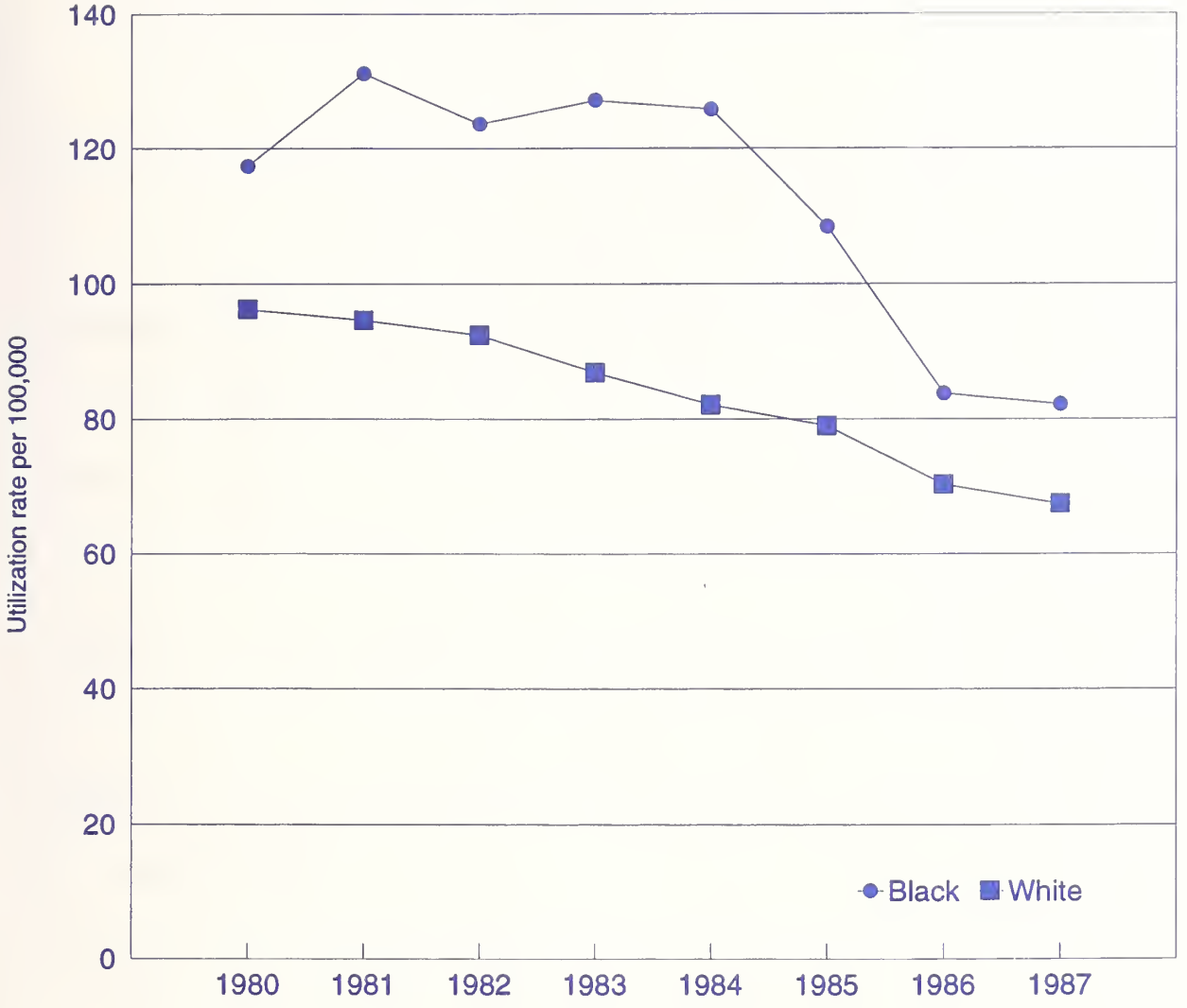
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	77.0 (55.5, 98.4)	69.9 (51.0, 88.7)	65.6 (50.2, 81.0)	58.9 (42.0, 75.8)	55.3 (35.7, 74.9)	42.4 (29.7, 55.2)	32.2 (20.8, 43.7)	25.2 (16.7, 33.7)	−14.4 (−17.4, −11.3)
White	65.1 (55.3, 74.9)	61.8 (53.0, 70.7)	53.6 (45.6, 61.6)	46.1 (38.6, 53.7)	42.8 (34.7, 50.9)	31.9 (25.5, 38.2)	23.4 (19.1, 27.8)	18.6 (15.0, 22.3)	−16.6 (−19.3, −13.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

113. Other procedures, female organs



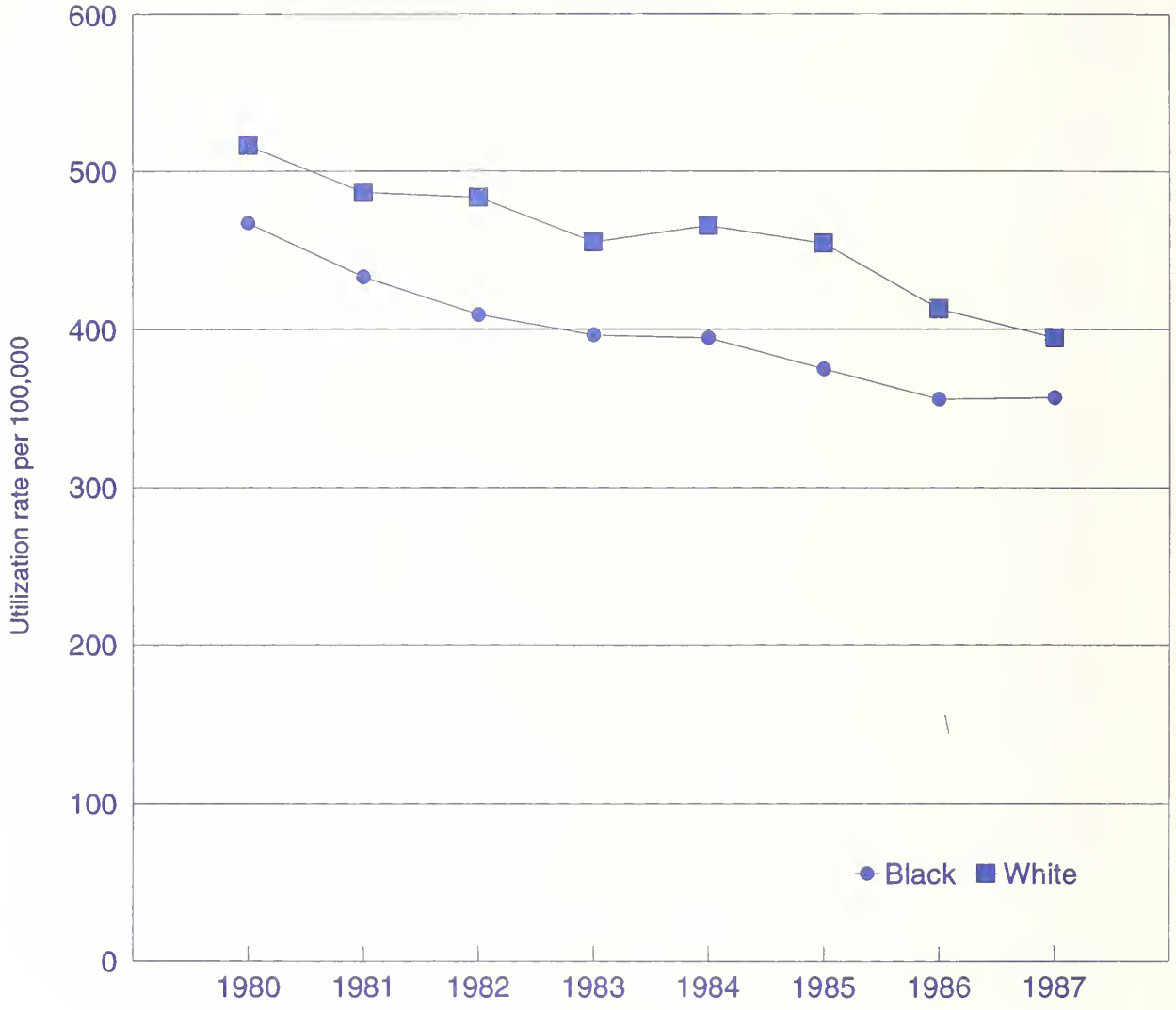
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	117.3 (92.4, 142.3)	131.1 (100.6, 161.7)	123.6 (77.6, 169.6)	127.1 (93.5, 160.6)	125.8 (86.6, 165.0)	108.4 (73.3, 143.6)	83.8 (60.9, 106.7)	82.2 (53.2, 111.2)	−5.9 (−9.3, −2.4)
White	96.2 (87.8, 104.5)	94.6 (86.9, 102.3)	92.4 (85.3, 99.5)	86.9 (80.1, 93.6)	82.1 (75.2, 89.1)	79.0 (71.1, 86.9)	70.3 (63.6, 77.1)	67.4 (59.9, 74.9)	−5.2 (−6.1, −4.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

114. Episiotomy



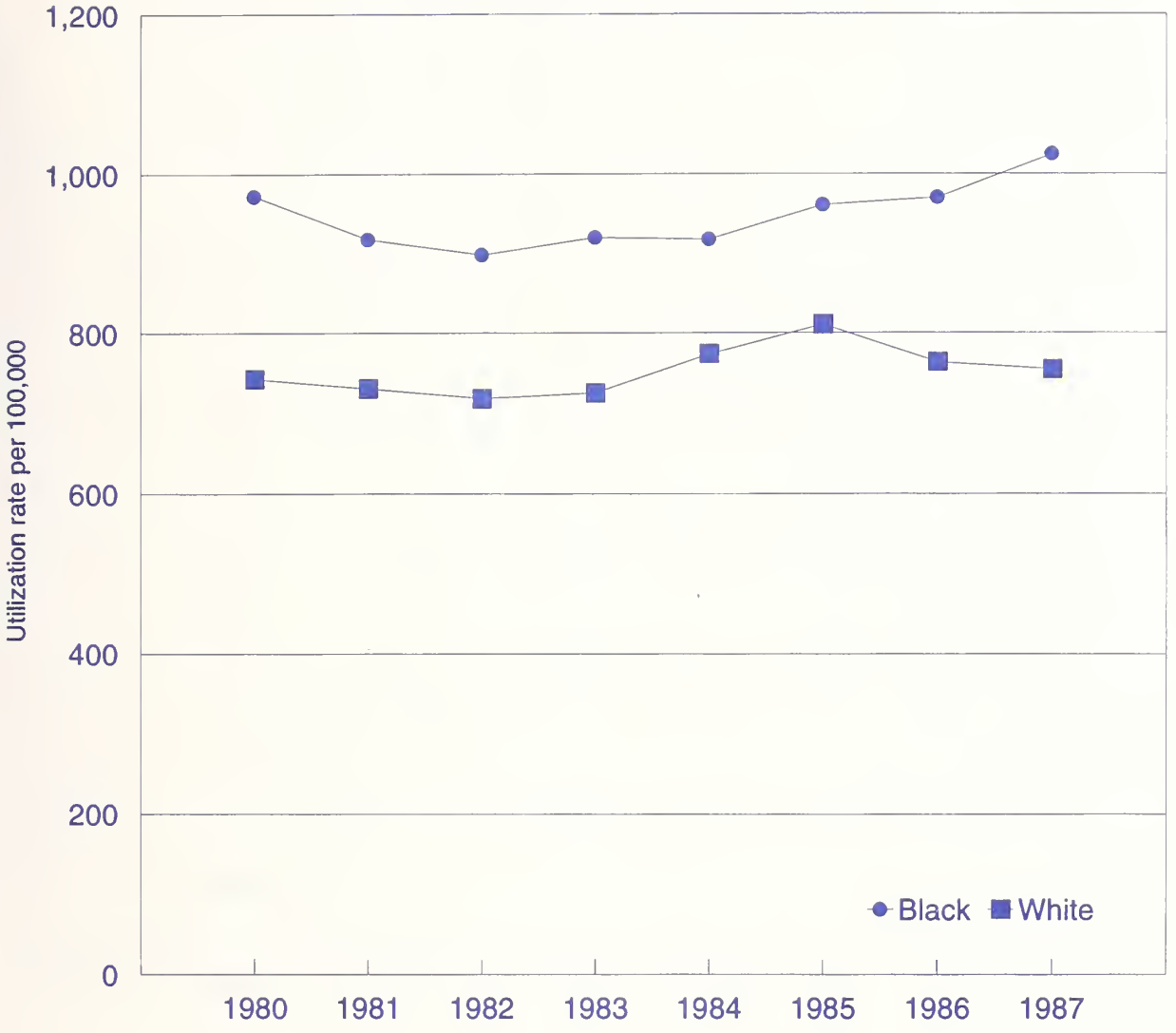
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	467.0 (378.7, 555.4)	432.9 (360.5, 505.3)	409.2 (323.9, 494.5)	396.4 (323.1, 469.7)	394.7 (321.3, 468.1)	374.9 (291.7, 458.1)	355.9 (272.5, 439.2)	356.9 (258.8, 455.0)	–3.7 (–4.3, –3.0)
White	516.3 (466.2, 566.3)	486.4 (436.0, 536.8)	483.3 (427.9, 538.7)	455.2 (411.0, 499.3)	465.5 (422.2, 508.8)	454.3 (411.8, 496.8)	412.8 (374.5, 451.1)	394.6 (357.4, 431.8)	–3.4 (–4.2, –2.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

115. Procedures to assist delivery



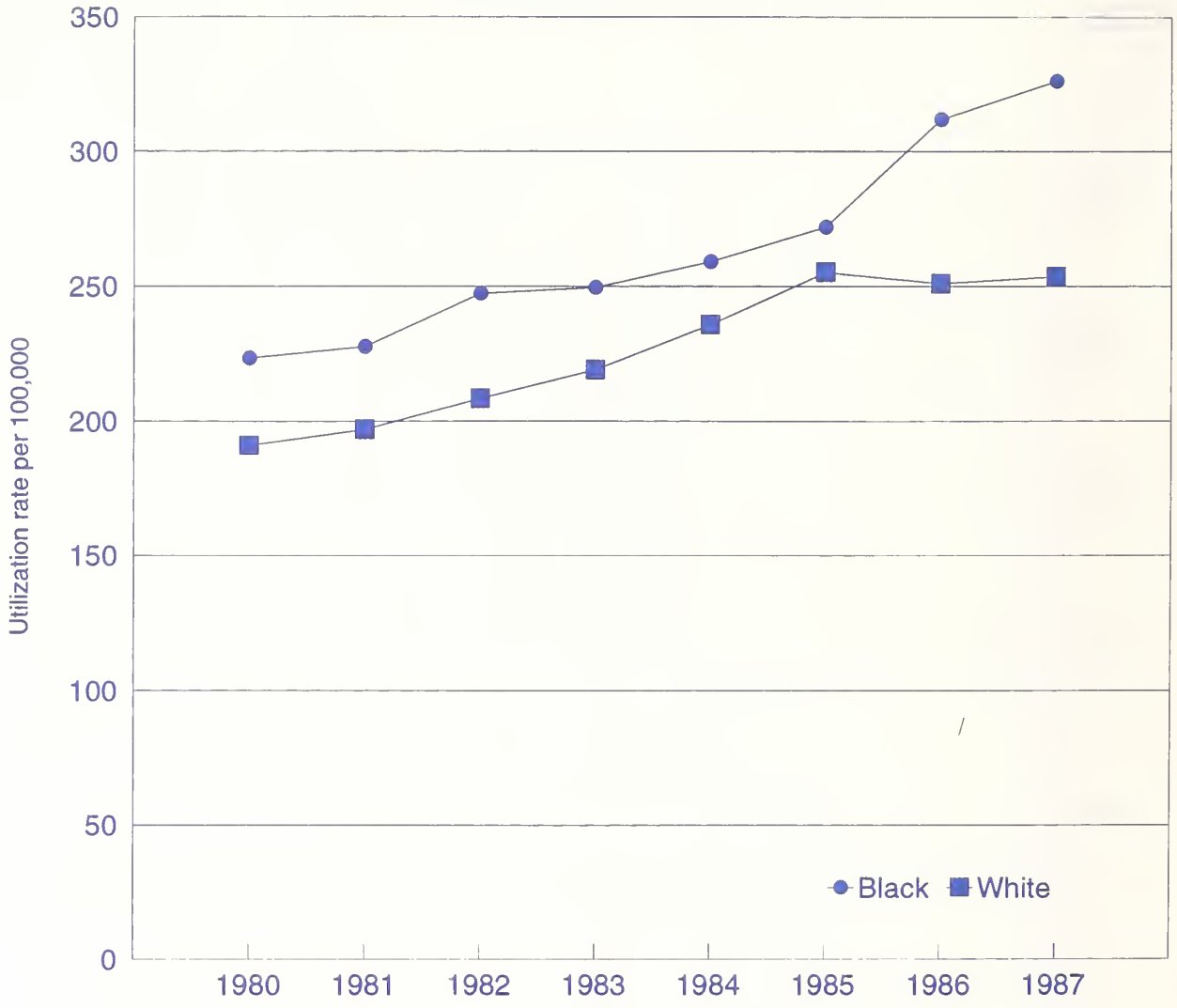
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	972.2 (767.5, 1,177.0)	917.3 (722.9, 1,111.6)	897.6 (685.9, 1,109.3)	919.7 (731.5, 1,107.9)	917.1 (728.9, 1,105.3)	960.8 (749.5, 1,172.1)	970.3 (736.8, 1,203.8)	1,024.9 (779.0, 1,270.8)	1.0 (–0.2, 2.2)
White	742.6 (655.6, 829.6)	730.9 (645.2, 816.6)	718.4 (628.8, 808.1)	725.4 (649.1, 801.7)	774.1 (694.2, 853.9)	810.6 (718.3, 903.0)	763.7 (678.2, 849.2)	754.6 (672.4, 836.9)	0.9 (–0.2, 2.0)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

116. Cesarean section



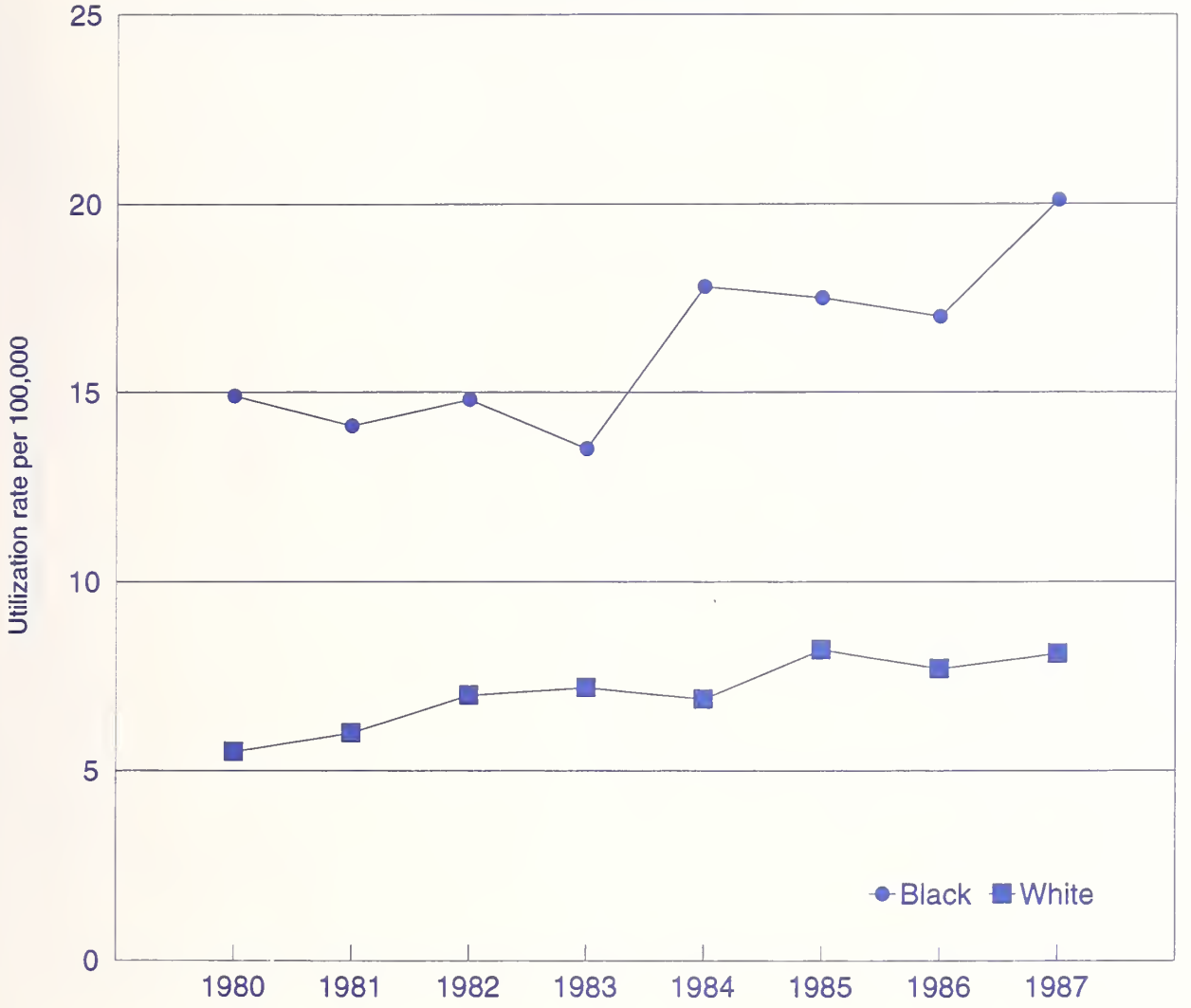
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	223.4 (183.3, 263.4)	227.7 (188.0, 267.4)	247.4 (200.6, 294.2)	249.6 (205.3, 293.8)	259.1 (209.5, 308.7)	271.9 (217.1, 326.8)	311.8 (246.1, 377.4)	326.1 (253.8, 398.5)	5.6 (4.4, 6.7)
White	191.0 (172.7, 209.2)	197.0 (177.6, 216.3)	208.4 (187.9, 228.8)	219.1 (197.9, 240.2)	235.8 (212.8, 258.8)	255.2 (228.9, 281.5)	251.0 (227.2, 274.7)	253.6 (229.7, 277.5)	4.7 (3.7, 5.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

117. Amniocentesis



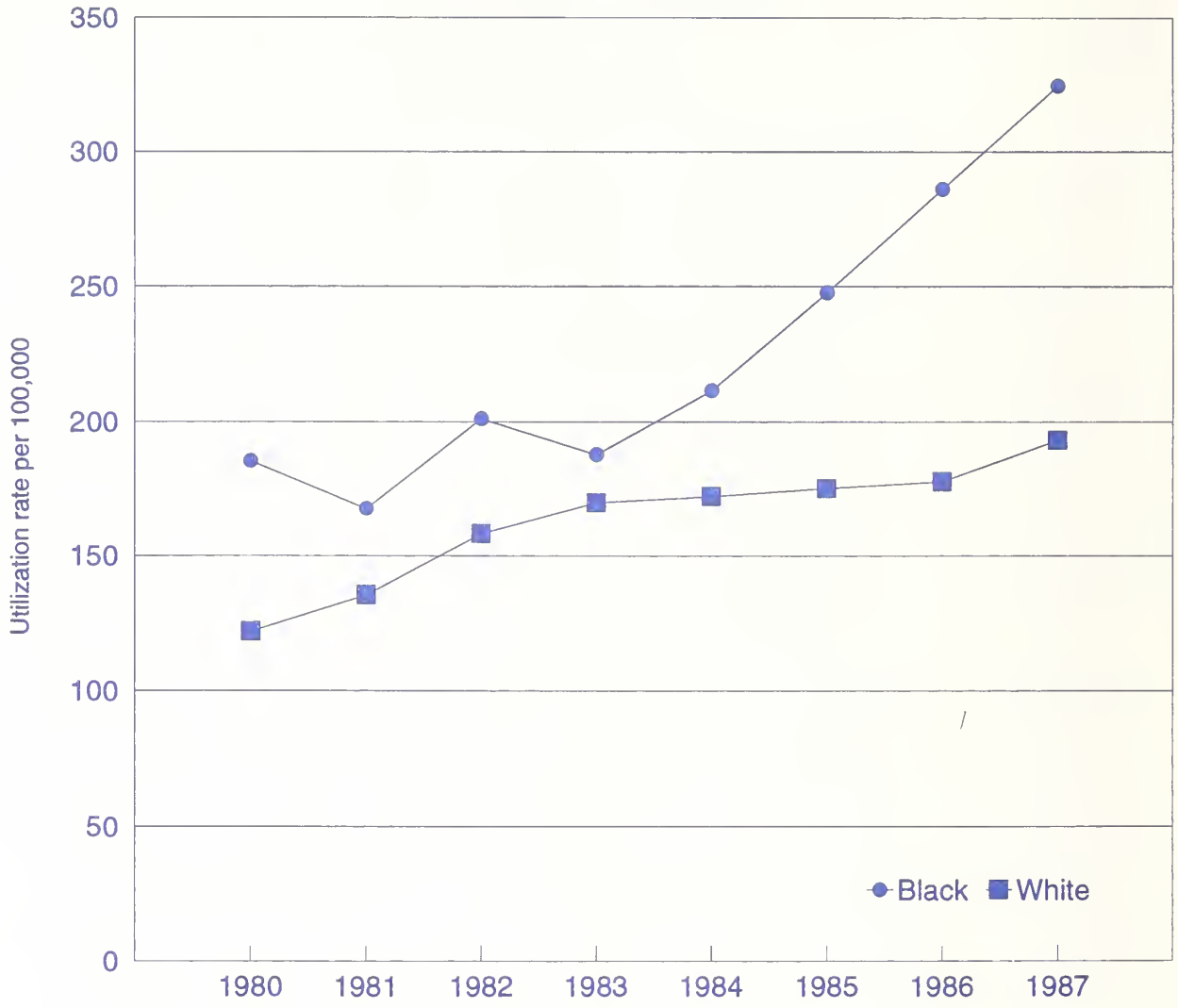
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	14.9 (9.8, 20.0)	14.1 (8.0, 20.2)	14.8 (8.4, 21.3)	13.5 (9.6, 17.5)	17.8 (11.7, 23.8)	17.5 (11.7, 23.4)	17.0 (9.6, 24.5)	20.1 (11.5, 28.7)	4.6 (2.0, 7.3)
White	5.5 (4.0, 7.1)	6.0 (4.4, 7.6)	7.0 (5.1, 8.8)	7.2 (4.8, 9.7)	6.9 (5.2, 8.6)	8.2 (5.9, 10.5)	7.7 (5.6, 9.7)	8.1 (6.2, 9.9)	5.3 (3.3, 7.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

118. Fetal monitoring



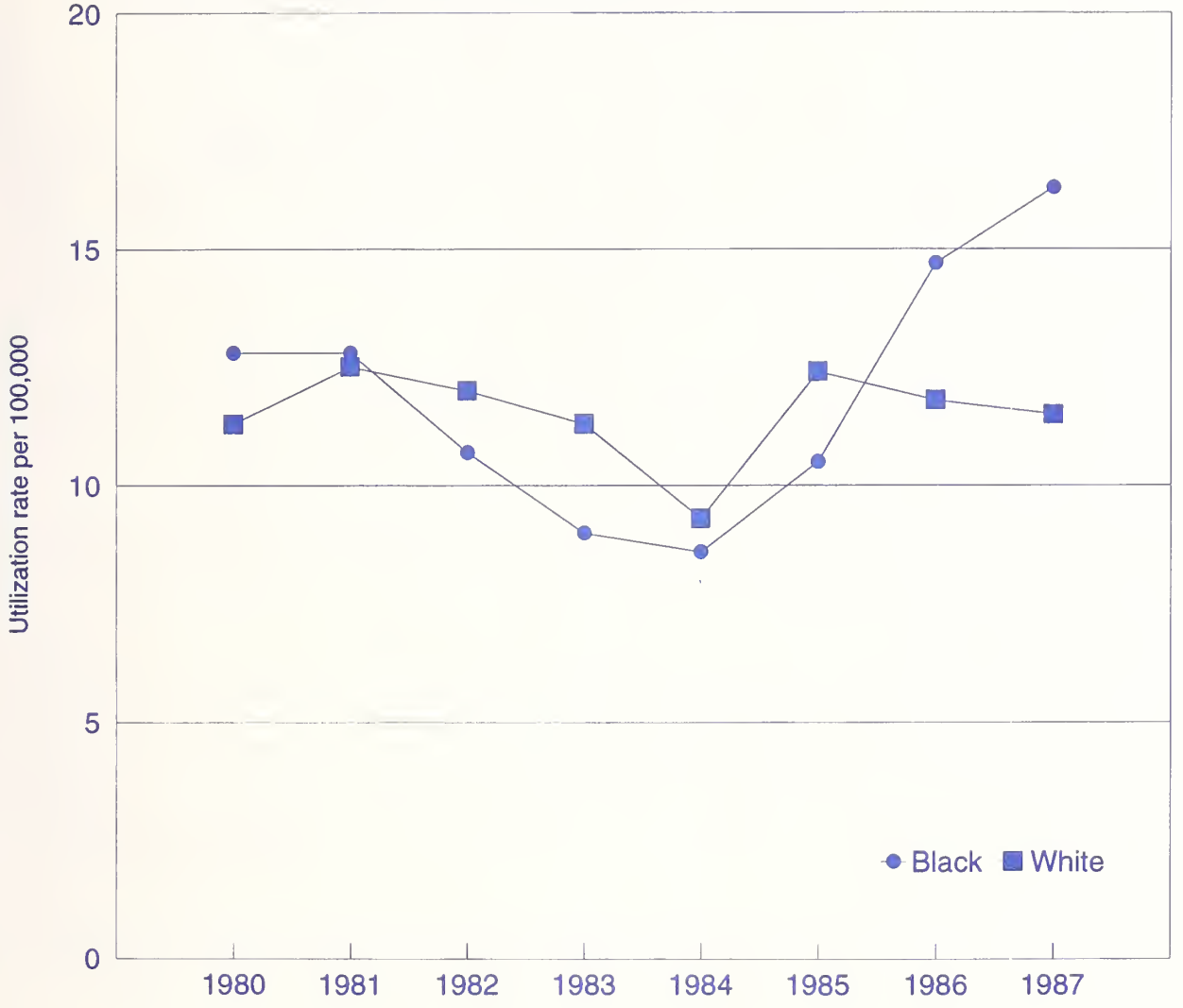
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	185.4 (91.2, 279.6)	167.5 (87.2, 247.9)	201.1 (105.9, 296.3)	187.8 (104.4, 271.1)	211.5 (120.0, 303.1)	247.6 (143.5, 351.6)	285.9 (150.6, 421.3)	324.6 (182.6, 466.7)	9.1 (6.1, 12.2)
White	121.7 (90.5, 152.8)	135.3 (102.3, 168.4)	158.2 (120.2, 196.2)	169.8 (126.9, 212.6)	172.2 (128.6, 215.8)	175.2 (133.1, 217.4)	177.7 (132.2, 223.1)	193.2 (141.5, 244.9)	6.0 (4.1, 8.0)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

119. Other obstetrical procedures



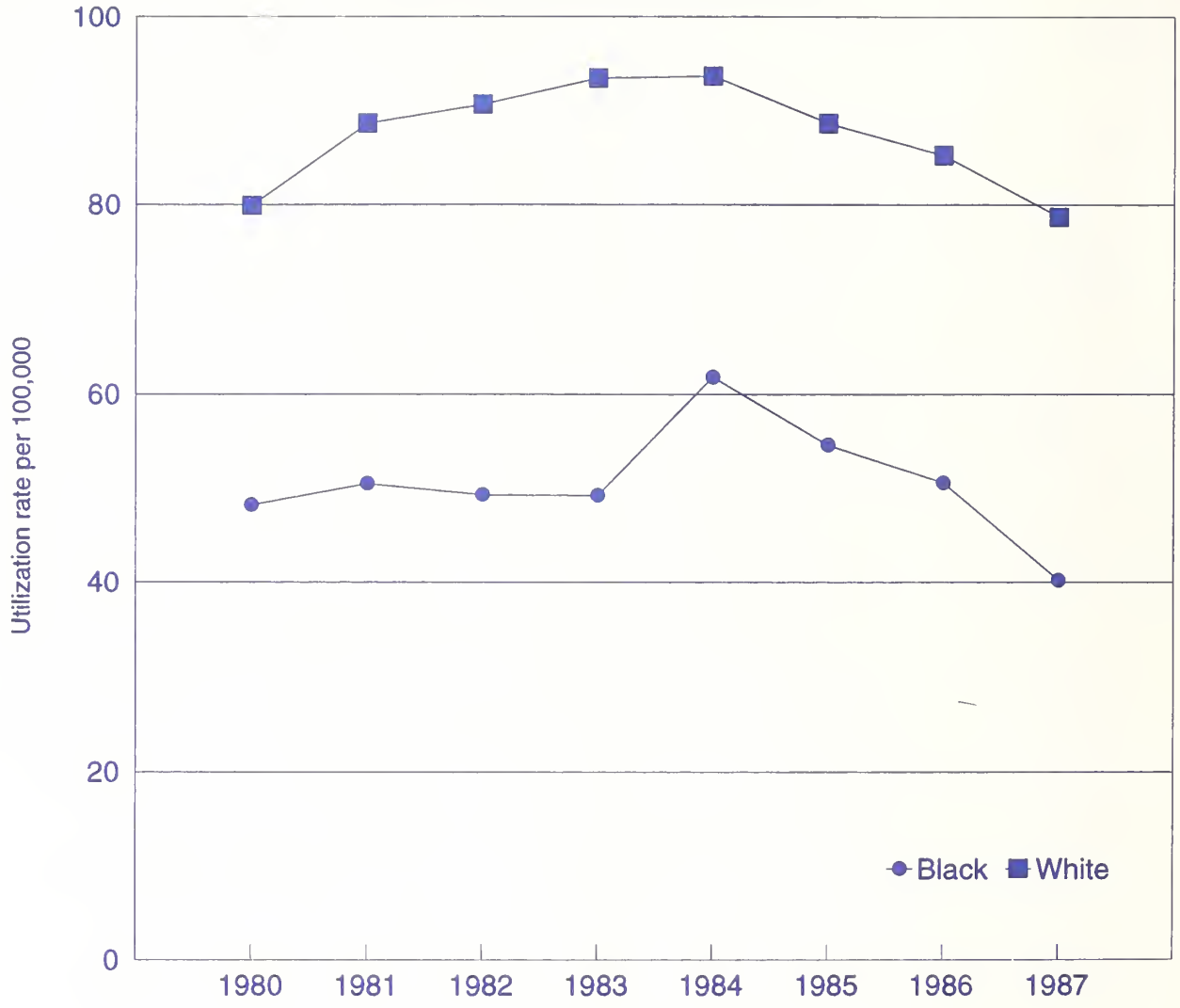
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	12.8 (4.2, 21.3)	12.8 (4.5, 21.1)	10.7 (4.3, 17.0)	9.0 (5.3, 12.8)	8.6 (5.1, 12.1)	10.5 (3.7, 17.4)	14.7 (3.4, 25.9)	16.3 (5.2, 27.4)	2.8 (−4.2, 10.3)
White	11.3 (5.1, 17.6)	12.5 (6.5, 18.5)	12.0 (6.0, 18.0)	11.3 (6.8, 15.7)	9.3 (6.1, 12.4)	12.4 (6.4, 18.3)	11.8 (6.4, 17.3)	11.5 (7.4, 15.7)	−0.3 (−3.4, 2.8)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

120. Partial excision of bone



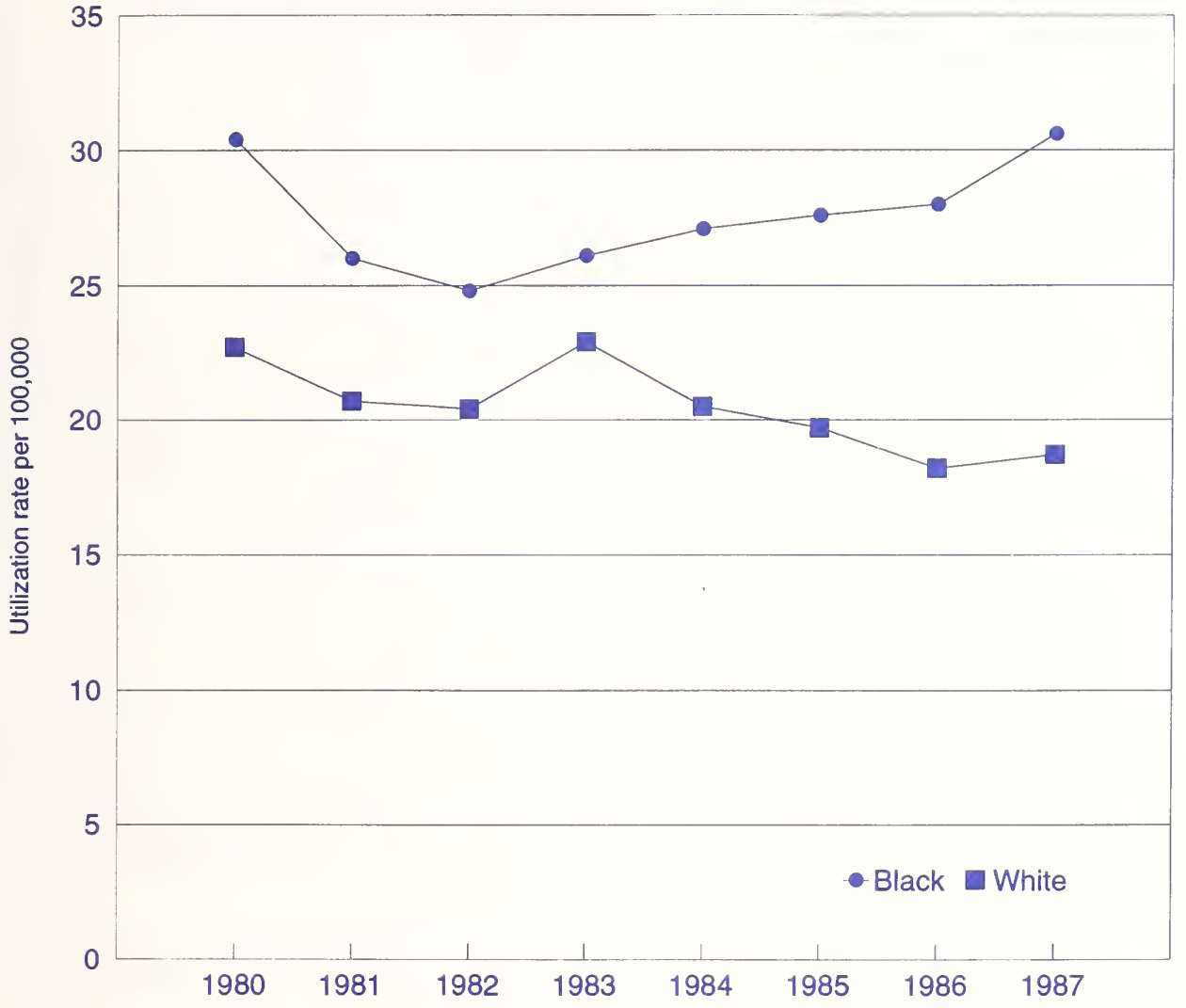
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	48.2 (38.9, 57.5)	50.5 (41.8, 59.2)	49.3 (40.8, 57.8)	49.2 (39.5, 58.8)	61.8 (49.2, 74.4)	54.6 (43.0, 66.2)	50.6 (40.5, 60.6)	40.2 (32.0, 48.4)	–0.9 (–4.6, 3.1)
White	79.9 (71.9, 87.8)	88.6 (80.8, 96.4)	90.6 (82.4, 98.8)	93.4 (84.3, 102.4)	93.6 (84.3, 103.0)	88.6 (77.1, 100.0)	85.2 (73.4, 96.9)	78.7 (66.8, 90.6)	–0.4 (–2.5, 1.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

121. Jaw fracture repair



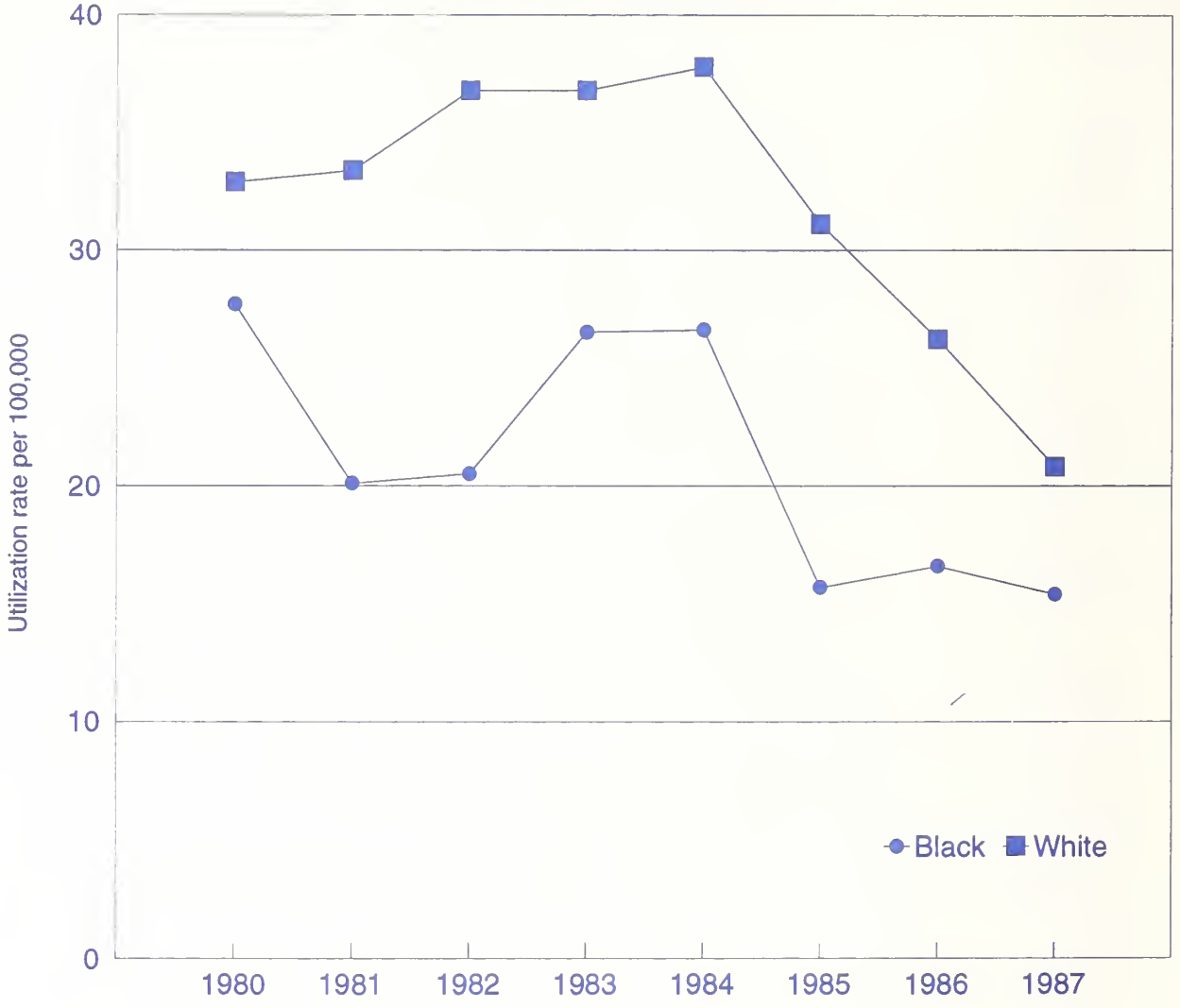
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	30.4 (21.9, 38.8)	26.0 (18.9, 33.1)	24.8 (18.4, 31.1)	26.1 (19.2, 33.0)	27.1 (20.0, 34.3)	27.6 (20.1, 35.1)	28.0 (19.9, 36.2)	30.6 (21.5, 39.6)	0.9 (−1.4, 3.3)
White	22.7 (20.2, 25.3)	20.7 (18.5, 23.0)	20.4 (18.4, 22.5)	22.9 (19.8, 26.0)	20.5 (18.0, 22.9)	19.7 (17.0, 22.5)	18.2 (16.1, 20.4)	18.7 (16.1, 21.2)	−2.6 (−4.2, −1.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

122. Bunionectomy



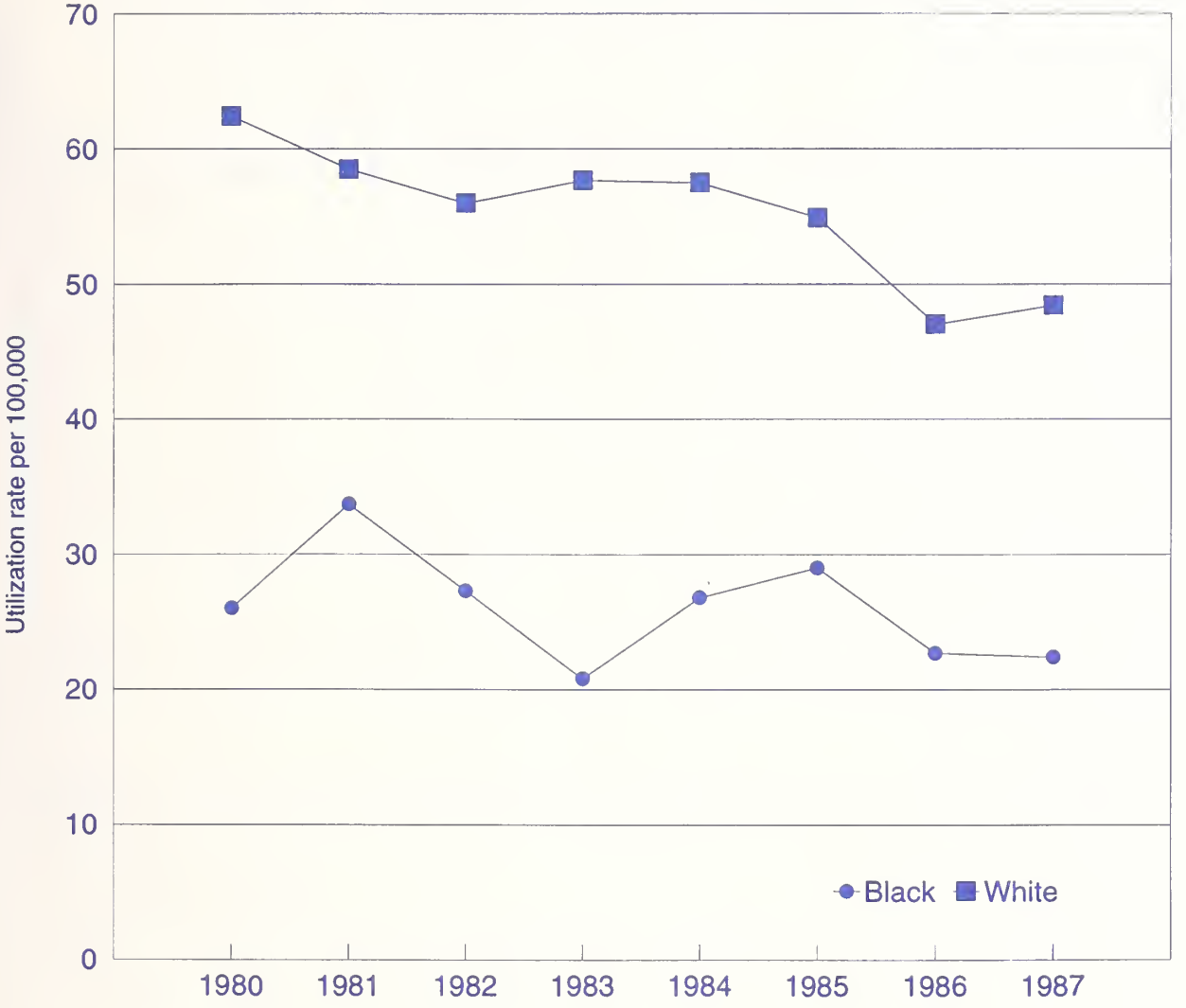
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	27.7 (19.4, 36.1)	20.1 (14.0, 26.1)	20.5 (14.3, 26.7)	26.5 (17.7, 35.2)	26.6 (19.9, 33.3)	15.7 (10.8, 20.7)	16.6 (11.0, 22.2)	15.4 (10.9, 19.8)	−6.8 (−12.0, −1.2)
White	32.9 (28.8, 37.0)	33.4 (29.9, 37.0)	36.8 (32.5, 41.1)	36.8 (33.0, 40.7)	37.8 (33.4, 42.2)	31.1 (27.7, 34.6)	26.2 (23.1, 29.3)	20.8 (17.9, 23.7)	−5.7 (−10.1, −1.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

123. Treatment, fracture of radius and ulna



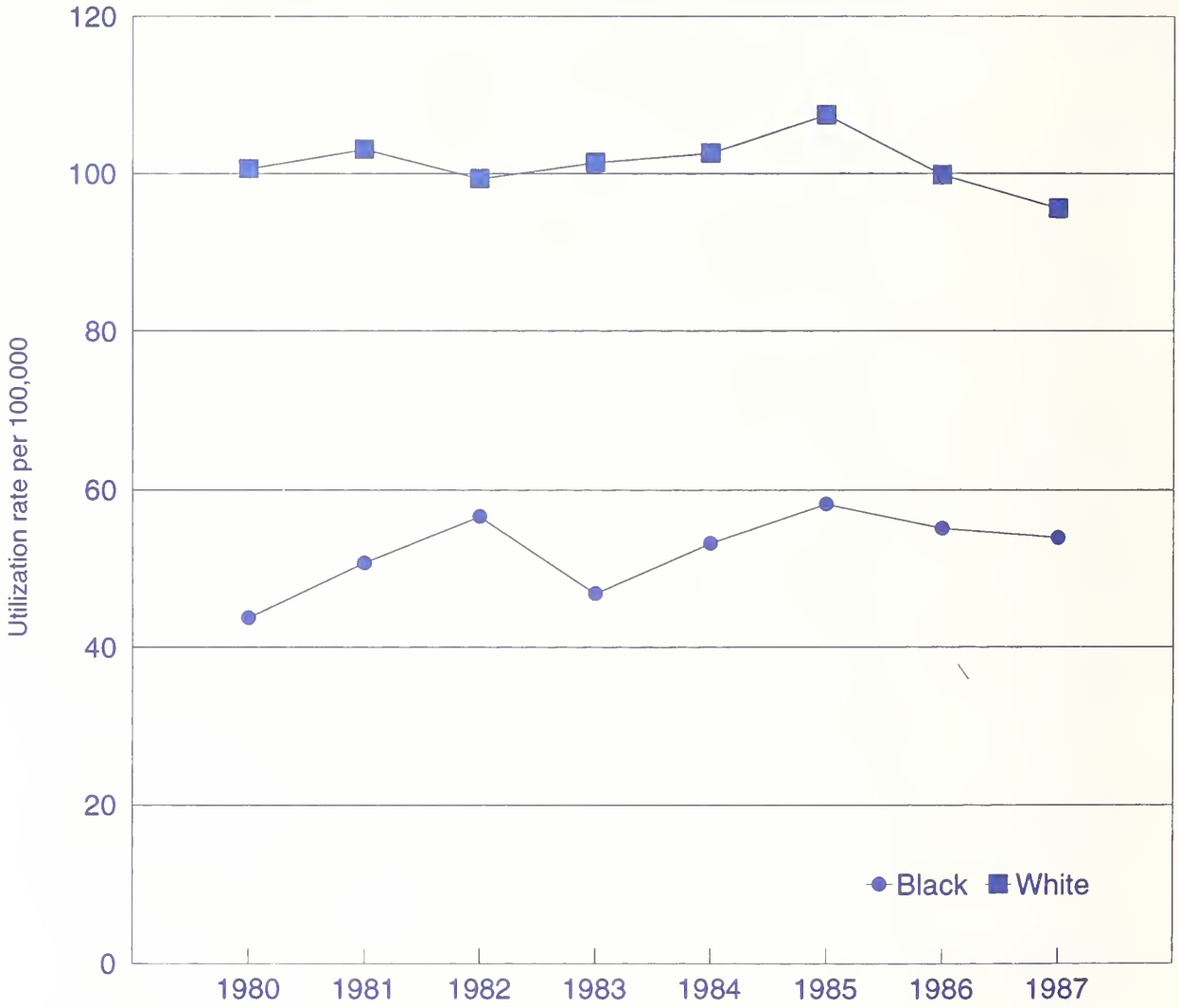
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	26.0 (19.3, 32.7)	33.7 (26.2, 41.2)	27.3 (21.2, 33.3)	20.8 (16.3, 25.3)	26.8 (21.1, 32.5)	29.0 (21.4, 36.7)	22.7 (15.6, 29.9)	22.4 (15.4, 29.5)	−3.0 (−7.3, 1.5)
White	62.4 (56.5, 68.2)	58.5 (53.3, 63.8)	56.0 (51.4, 60.7)	57.7 (53.3, 62.2)	57.5 (53.0, 62.0)	54.9 (50.3, 59.5)	47.0 (43.1, 50.9)	48.4 (43.7, 53.0)	−3.4 (−4.8, −2.0)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

124. Treatment, fracture of hip and femur



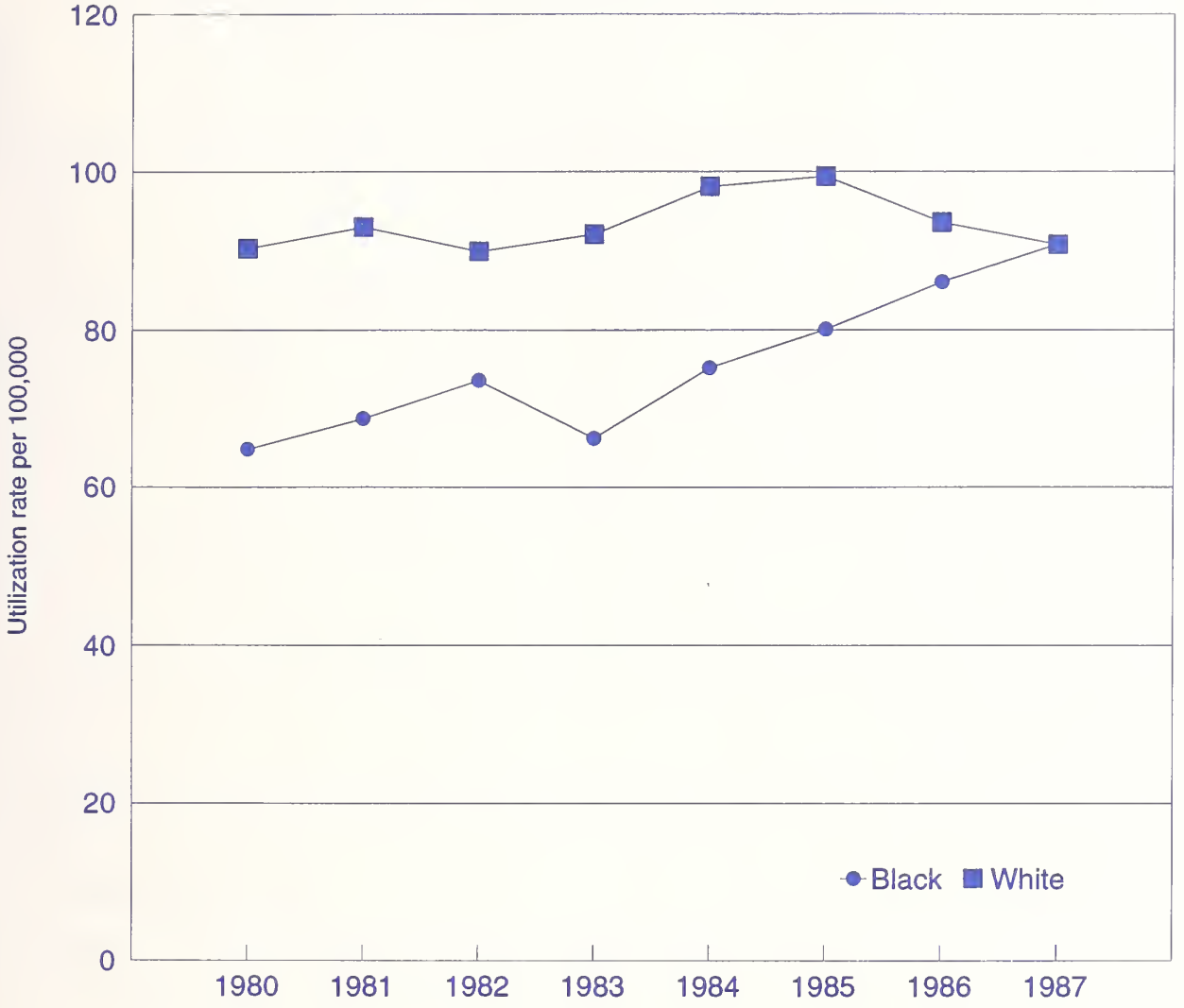
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	43.7 (33.7, 53.6)	50.7 (41.4, 60.1)	56.6 (45.7, 67.4)	46.8 (38.2, 55.3)	53.2 (44.0, 62.5)	58.2 (46.9, 69.5)	55.1 (43.5, 66.8)	53.9 (42.5, 65.3)	2.5 (0.0, 5.1)
White	100.6 (92.7, 108.5)	103.1 (96.3, 109.8)	99.3 (92.9, 105.7)	101.4 (94.9, 107.9)	102.6 (96.0, 109.1)	107.5 (100.4, 114.6)	99.8 (93.1, 106.6)	95.5 (89.0, 102.0)	–0.3 (–1.4, 0.8)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

125. Treatment, fracture of lower extremity



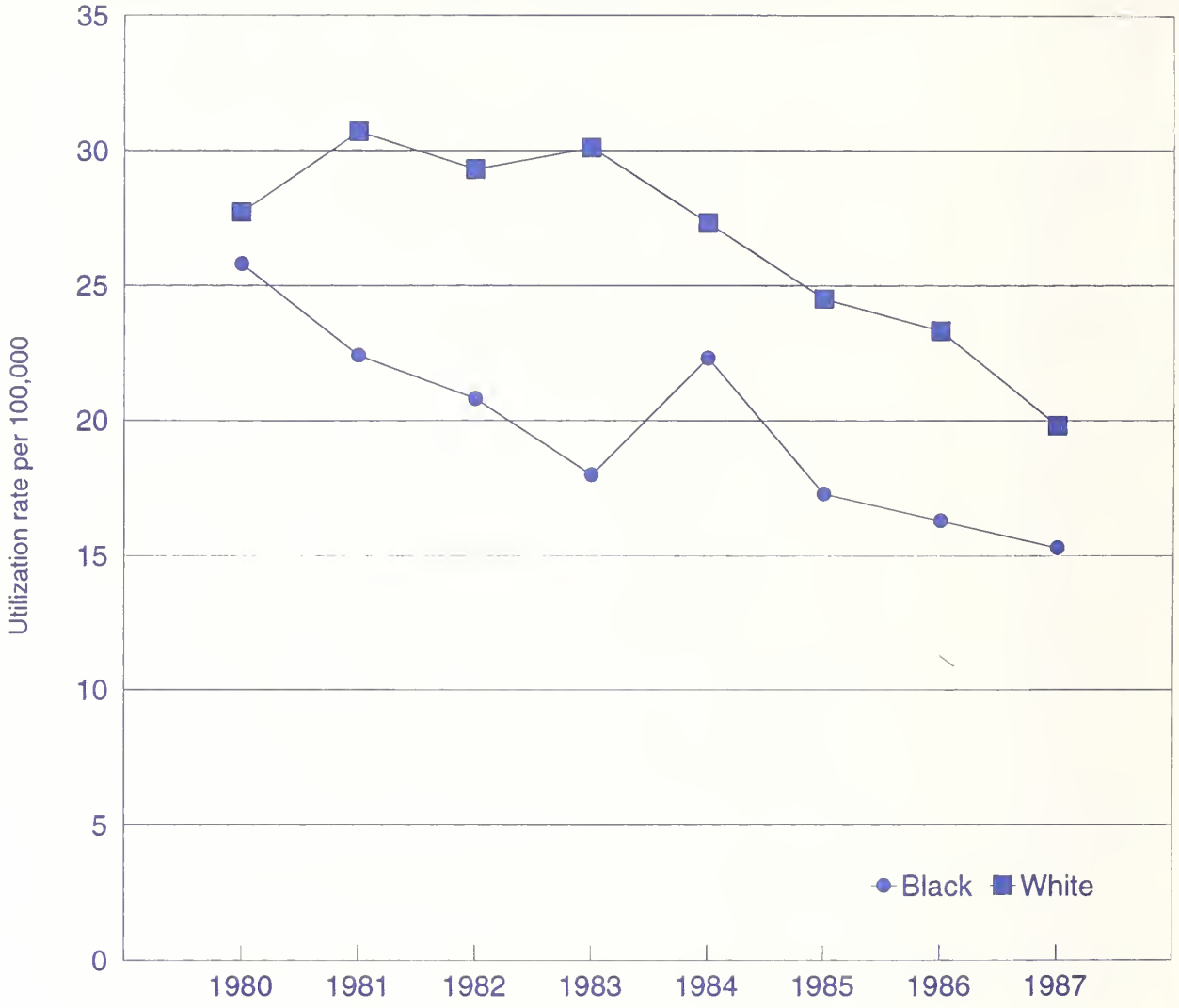
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	64.8 (52.5, 77.1)	68.7 (55.9, 81.5)	73.6 (60.1, 87.1)	66.2 (53.0, 79.5)	75.2 (63.3, 87.2)	80.1 (65.4, 94.9)	86.1 (63.4, 108.9)	90.9 (68.7, 113.1)	4.7 (3.1, 6.3)
White	90.3 (82.4, 98.2)	93.0 (85.7, 100.3)	89.9 (83.0, 96.7)	92.1 (85.4, 98.7)	98.1 (90.7, 105.6)	99.4 (91.5, 107.2)	93.6 (85.7, 101.5)	90.8 (83.2, 98.4)	0.5 (−0.6, 1.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

126. Incision of bone



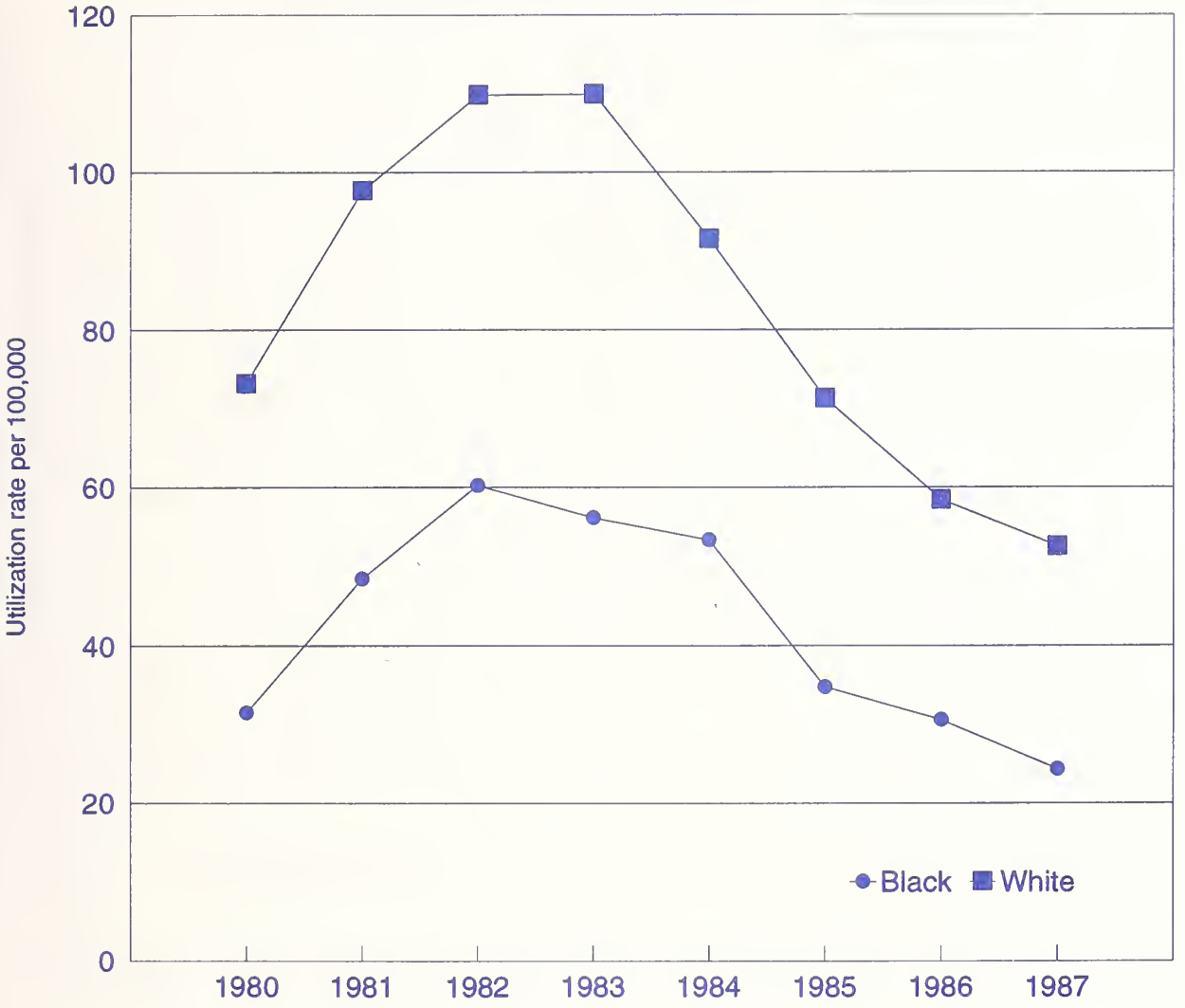
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	25.8 (19.0, 32.7)	22.4 (17.0, 27.7)	20.8 (14.6, 27.1)	18.0 (13.6, 22.4)	22.3 (16.6, 28.0)	17.3 (13.0, 21.7)	16.3 (12.3, 20.4)	15.3 (10.7, 19.9)	−6.4 (−8.9, −3.9)
White	27.7 (25.0, 30.4)	30.7 (27.8, 33.6)	29.3 (26.4, 32.2)	30.1 (27.2, 32.9)	27.3 (24.4, 30.2)	24.5 (21.9, 27.1)	23.3 (20.6, 26.1)	19.8 (17.1, 22.5)	−5.1 (−7.5, −2.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

127. Arthroscopy



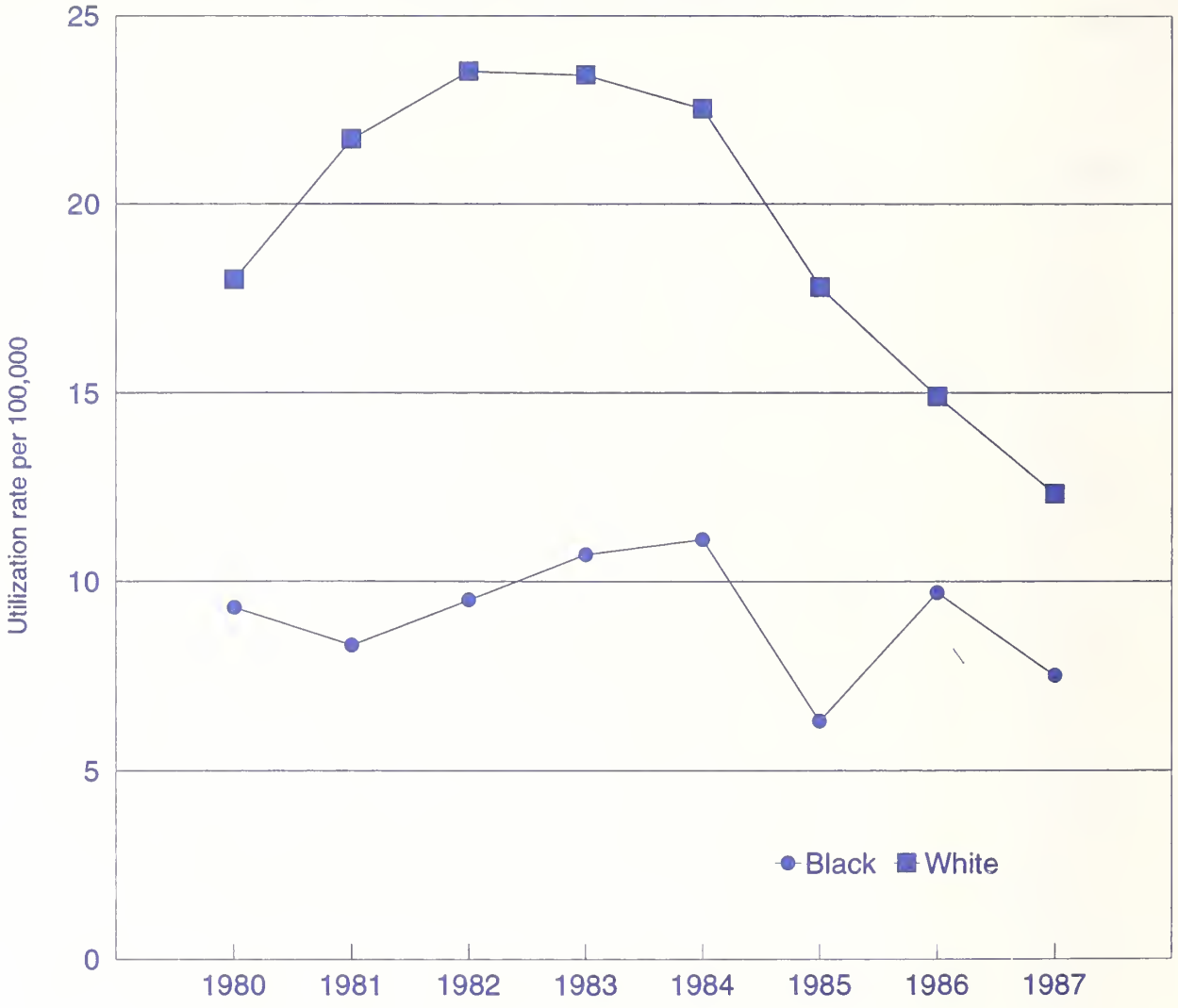
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	31.5	48.4	60.2	56.1	53.3	34.8	30.6	24.3	–6.7
	(25.0,	(39.8,	(47.2,	(43.3,	(40.9,	(26.8,	(23.6,	(17.1,	(–15.2,
	38.1)	57.0)	73.2)	69.0)	65.8)	42.8)	37.6)	31.5)	2.6)
White	73.2	97.7	109.8	109.9	91.6	71.3	58.4	52.5	–7.3
	(61.9,	(86.3,	(96.2,	(96.0,	(79.2,	(57.6,	(43.8,	(37.9,	(–13.5,
	84.5)	109.1)	123.4)	123.8)	104.0)	85.0)	73.0)	67.0)	–0.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

128. Division of joint capsule, cartilage



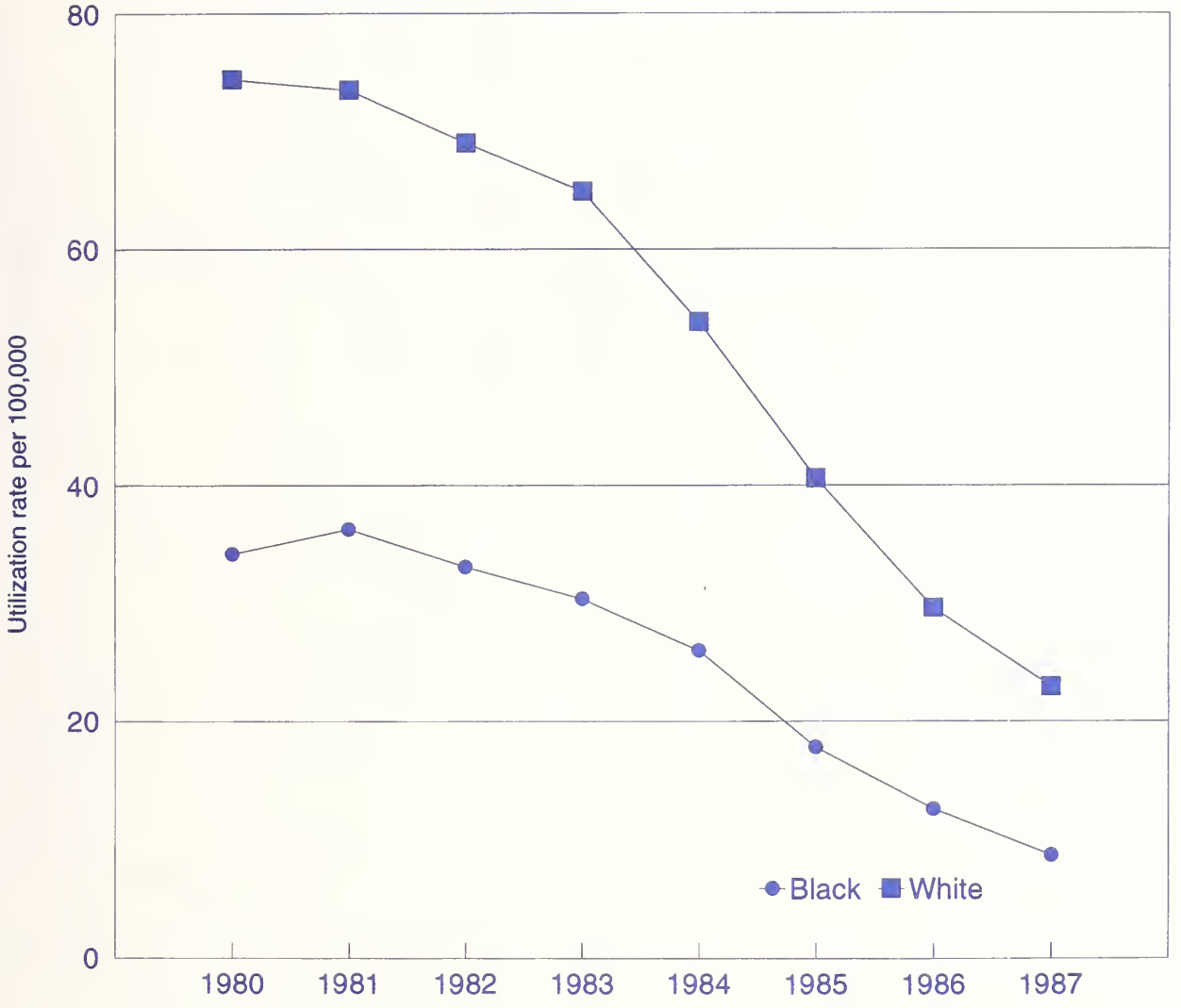
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	9.3	8.3	9.5	10.7	11.1	6.3	9.7	7.5	–2.2
	(6.4,	(5.9,	(6.5,	(7.2,	(7.6,	(4.2,	(6.3,	(4.9,	(–7.8,
	12.2)	10.6)	12.5)	14.1)	14.5)	8.4)	13.1)	10.1)	3.7)
White	18.0	21.7	23.5	23.4	22.5	17.8	14.9	12.3	–6.2
	(15.6,	(18.8,	(20.1,	(20.2,	(19.9,	(15.2,	(12.4,	(10.1,	(–11.4,
	20.3)	24.5)	26.9)	26.6)	25.1)	20.5)	17.4)	14.6)	–0.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

129. Excision of semilunar cartilage of knee



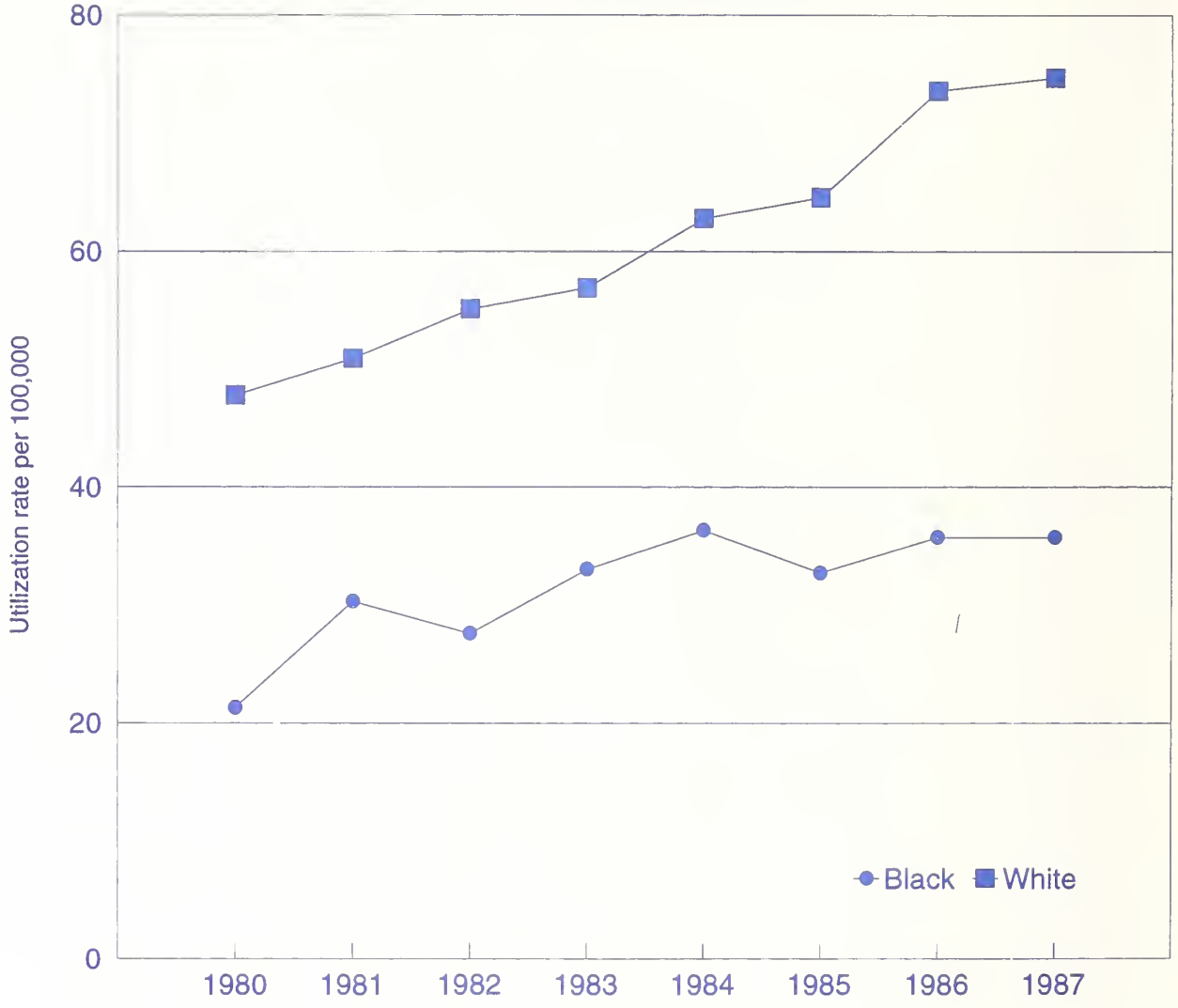
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	34.2 (27.8, 40.7)	36.3 (29.3, 43.2)	33.1 (26.5, 39.6)	30.4 (24.3, 36.5)	26.0 (20.1, 32.0)	17.8 (13.4, 22.1)	12.6 (8.8, 16.5)	8.7 (5.5, 11.9)	−18.2 (−23.2, −12.9)
White	74.4 (66.1, 82.6)	73.5 (66.3, 80.8)	69.0 (61.3, 76.8)	64.9 (56.7, 73.1)	53.8 (46.6, 61.0)	40.6 (32.3, 48.9)	29.6 (22.4, 36.9)	22.9 (15.7, 30.0)	−15.9 (−19.8, −11.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

130. Arthroplasty of knee



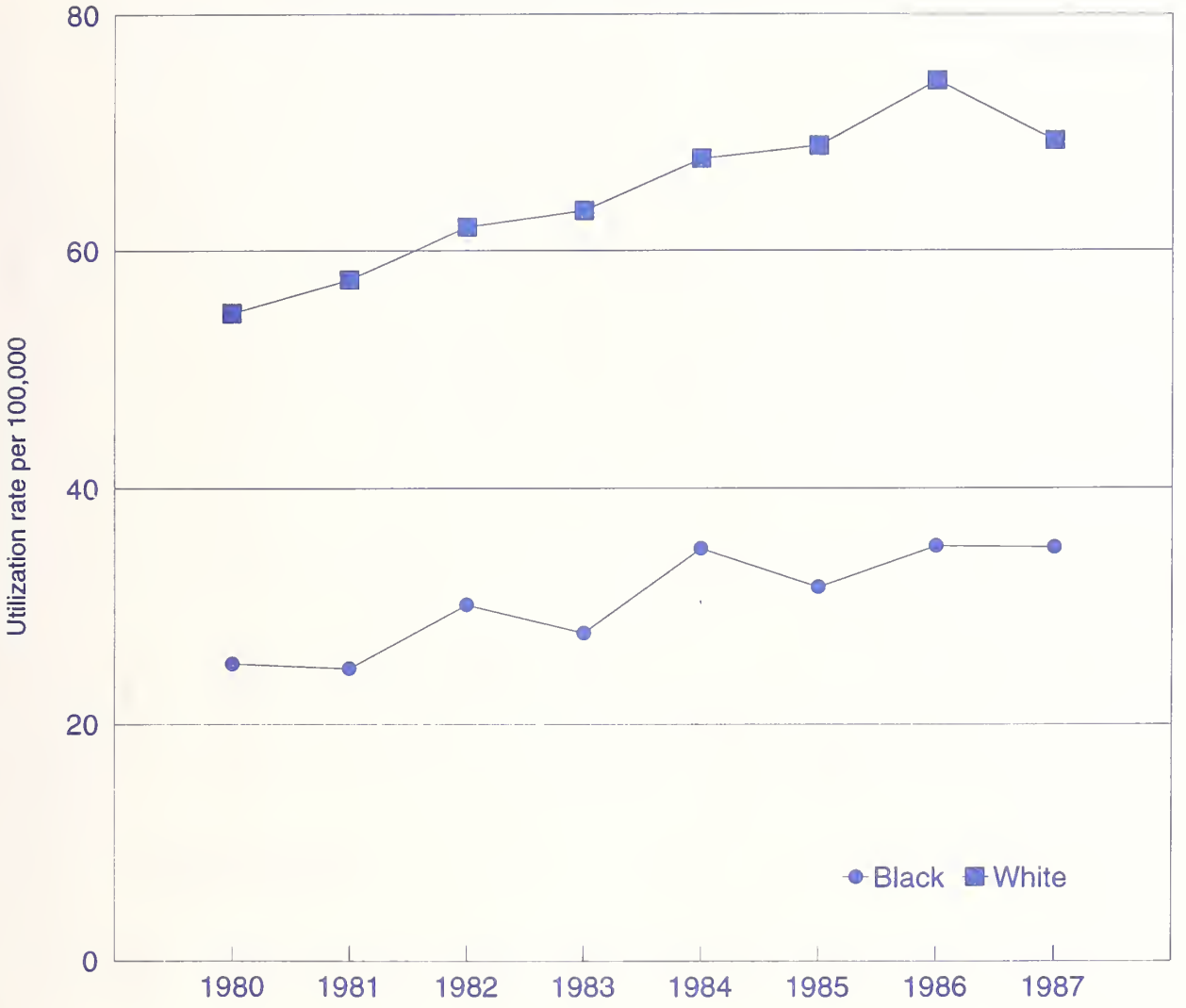
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	21.3 (16.5, 26.2)	30.3 (23.9, 36.7)	27.6 (21.5, 33.8)	33.0 (25.1, 41.0)	36.3 (28.8, 43.8)	32.7 (26.0, 39.4)	35.7 (27.6, 43.9)	35.7 (25.9, 45.4)	6.2 (2.6, 9.8)
White	47.8 (42.3, 53.3)	50.9 (45.4, 56.3)	55.1 (49.1, 61.1)	56.9 (51.0, 62.8)	62.8 (56.4, 69.3)	64.6 (57.0, 72.2)	73.6 (63.5, 83.7)	74.7 (63.3, 86.1)	6.8 (6.1, 7.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

131. Hip replacement, total and partial



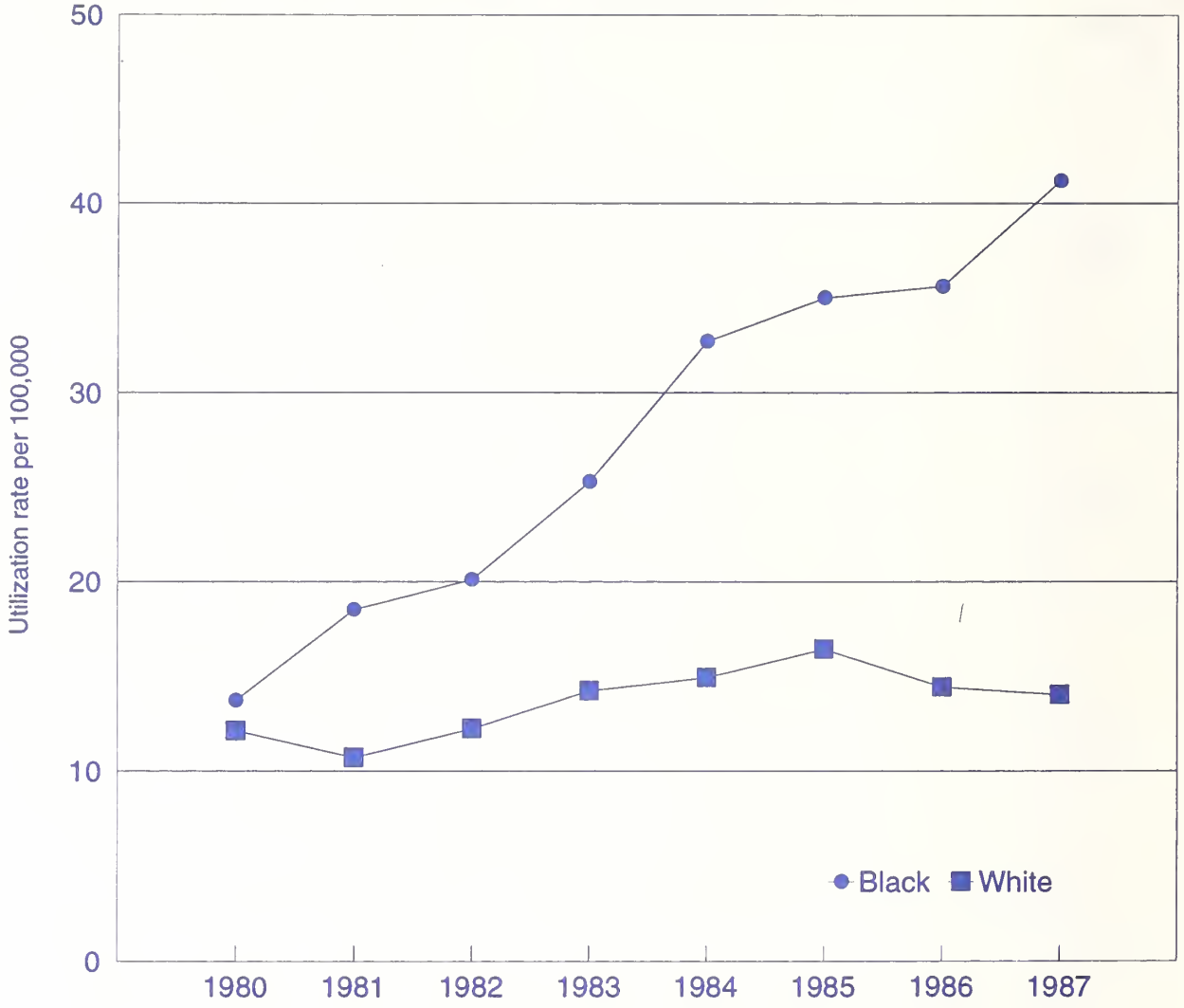
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	25.1 (19.1, 31.0)	24.7 (18.3, 31.2)	30.1 (22.6, 37.6)	27.7 (20.7, 34.8)	34.9 (27.2, 42.6)	31.6 (25.1, 38.1)	35.1 (25.4, 44.8)	35.0 (26.8, 43.2)	5.5 (3.2, 7.8)
White	54.7 (49.6, 59.7)	57.5 (52.5, 62.6)	62.0 (56.9, 67.1)	63.4 (58.4, 68.3)	67.8 (62.4, 73.1)	68.9 (62.8, 75.0)	74.4 (67.7, 81.0)	69.3 (63.0, 75.7)	4.0 (2.9, 5.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

132. Arthrocentesis



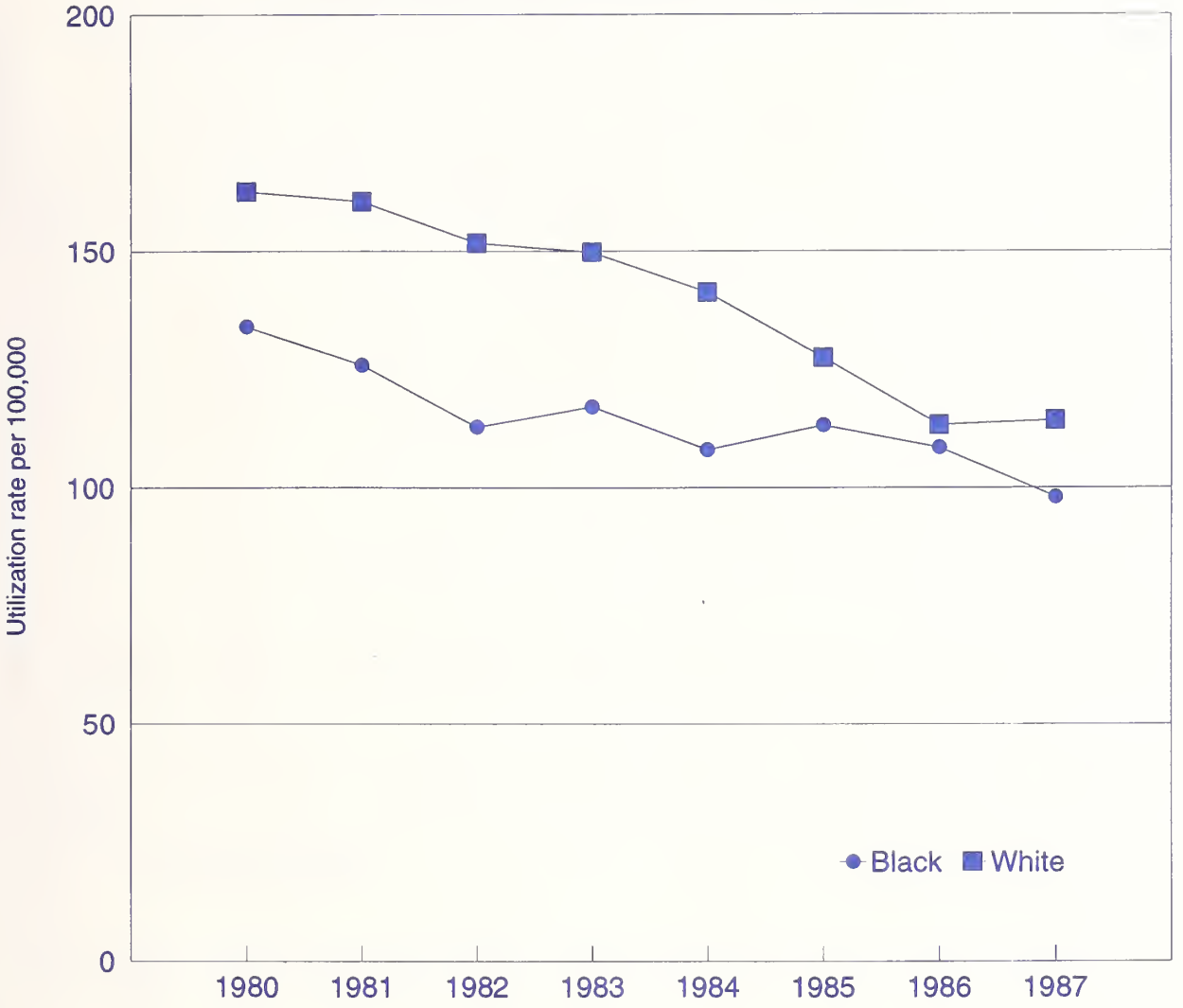
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	13.7 (10.2, 17.1)	18.5 (13.9, 23.0)	20.1 (14.7, 25.4)	25.3 (19.3, 31.2)	32.7 (24.3, 41.1)	35.0 (25.2, 44.8)	35.6 (24.0, 47.2)	41.2 (30.1, 52.3)	16.6 (13.3, 20.1)
White	12.1 (10.4, 13.8)	10.7 (9.4, 12.1)	12.2 (10.6, 13.7)	14.2 (12.5, 15.8)	14.9 (13.1, 16.6)	16.4 (14.3, 18.6)	14.4 (12.5, 16.2)	14.0 (12.2, 15.8)	4.2 (1.0, 7.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

133. Procedures on muscles and tendons



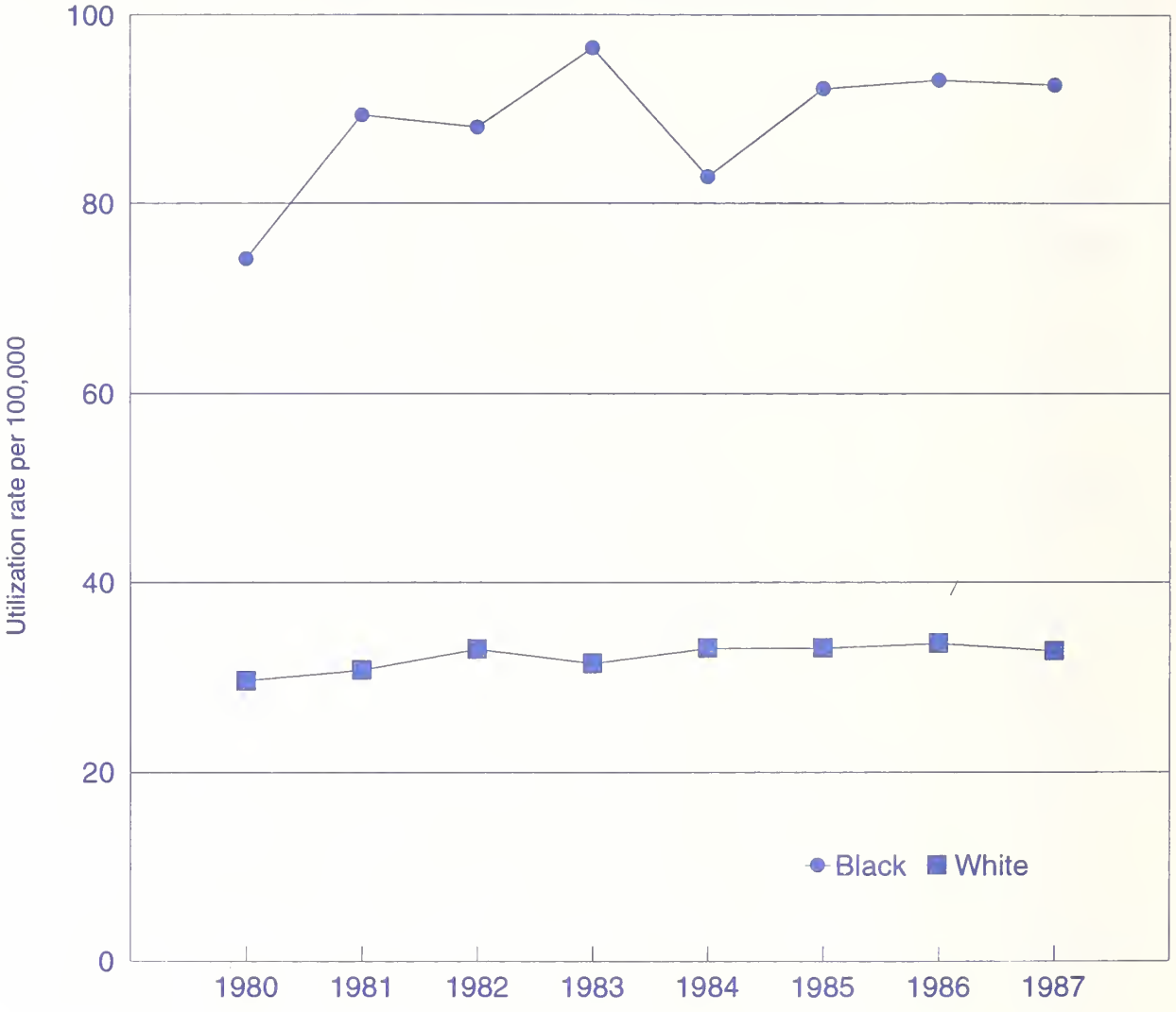
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	133.9 (110.9, 156.9)	125.8 (103.0, 148.5)	112.7 (92.9, 132.5)	117.0 (98.0, 136.0)	107.9 (90.4, 125.3)	113.1 (94.8, 131.5)	108.4 (88.9, 127.8)	98.0 (79.6, 116.4)	−3.5 (−4.8, −2.2)
White	162.6 (150.3, 174.9)	160.5 (148.9, 172.2)	151.7 (140.5, 162.8)	149.7 (138.1, 161.2)	141.2 (129.8, 152.6)	127.4 (115.6, 139.2)	113.2 (100.9, 125.5)	114.2 (100.1, 128.3)	−5.6 (−6.7, −4.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

134. Amputation of lower extremity



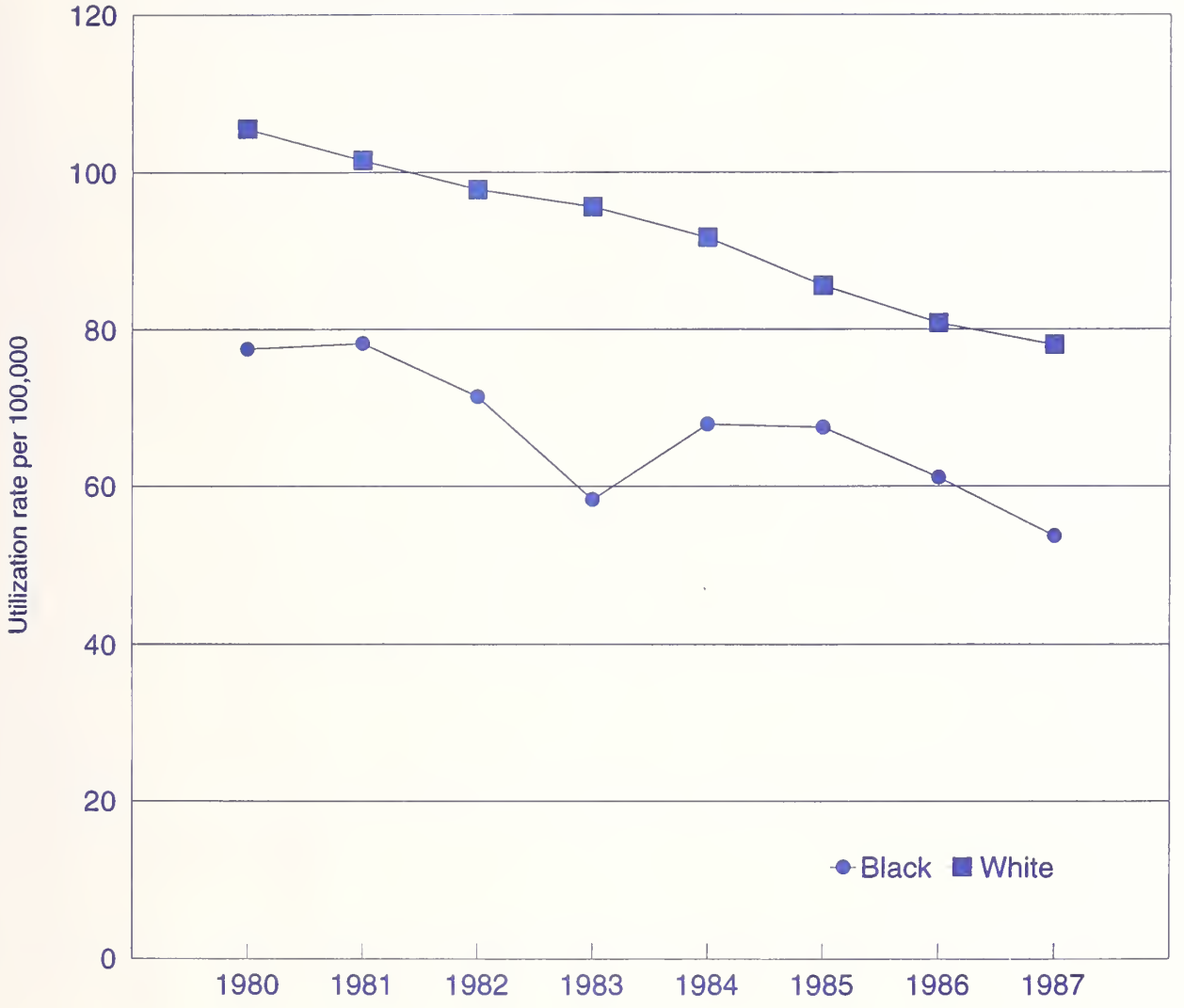
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	74.1 (60.0, 88.1)	89.4 (73.5, 105.3)	88.1 (71.8, 104.4)	96.5 (80.8, 112.2)	82.8 (68.8, 96.9)	92.2 (76.0, 108.5)	93.1 (75.2, 111.1)	92.6 (75.5, 109.6)	2.1 (–0.1, 4.4)
White	29.6 (27.2, 31.9)	30.7 (28.3, 33.2)	32.9 (30.4, 35.4)	31.4 (28.9, 33.8)	33.0 (30.6, 35.4)	33.0 (30.3, 35.7)	33.5 (30.9, 36.2)	32.7 (29.6, 35.9)	1.4 (0.6, 2.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

135. Other fracture and dislocation procedures



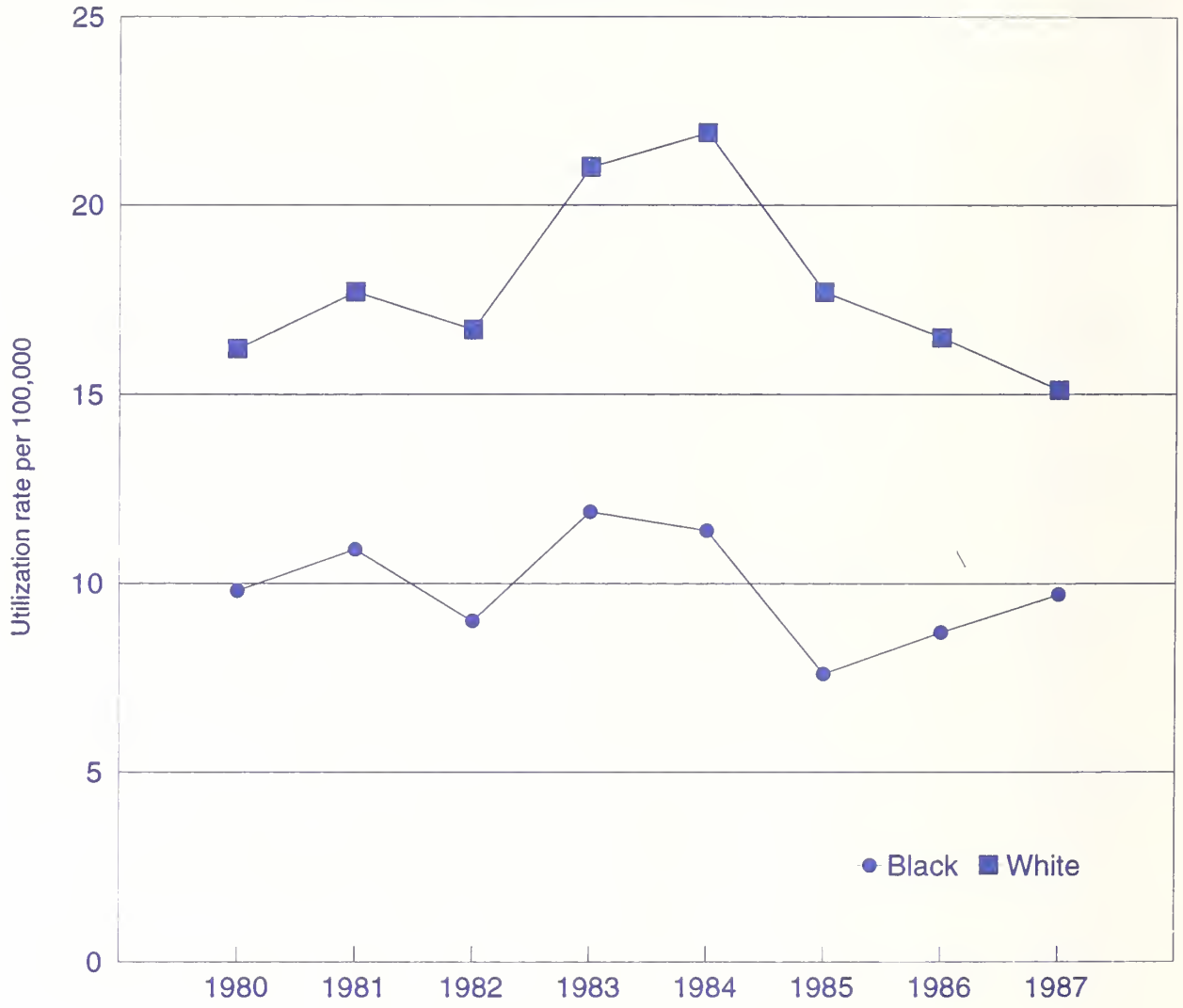
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	77.5 (62.0, 93.1)	78.2 (59.4, 96.9)	71.4 (56.1, 86.8)	58.3 (46.2, 70.5)	67.9 (55.0, 80.7)	67.5 (54.7, 80.4)	61.1 (49.7, 72.6)	53.7 (40.7, 66.8)	–4.4 (–6.7, –2.1)
White	105.5 (96.5, 114.4)	101.5 (93.6, 109.5)	97.8 (89.5, 106.0)	95.6 (88.4, 102.7)	91.7 (84.8, 98.6)	85.6 (78.4, 92.7)	80.8 (74.2, 87.4)	78.0 (71.6, 84.5)	–4.3 (–4.8, –3.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

136. Other local excision of lesion of joint



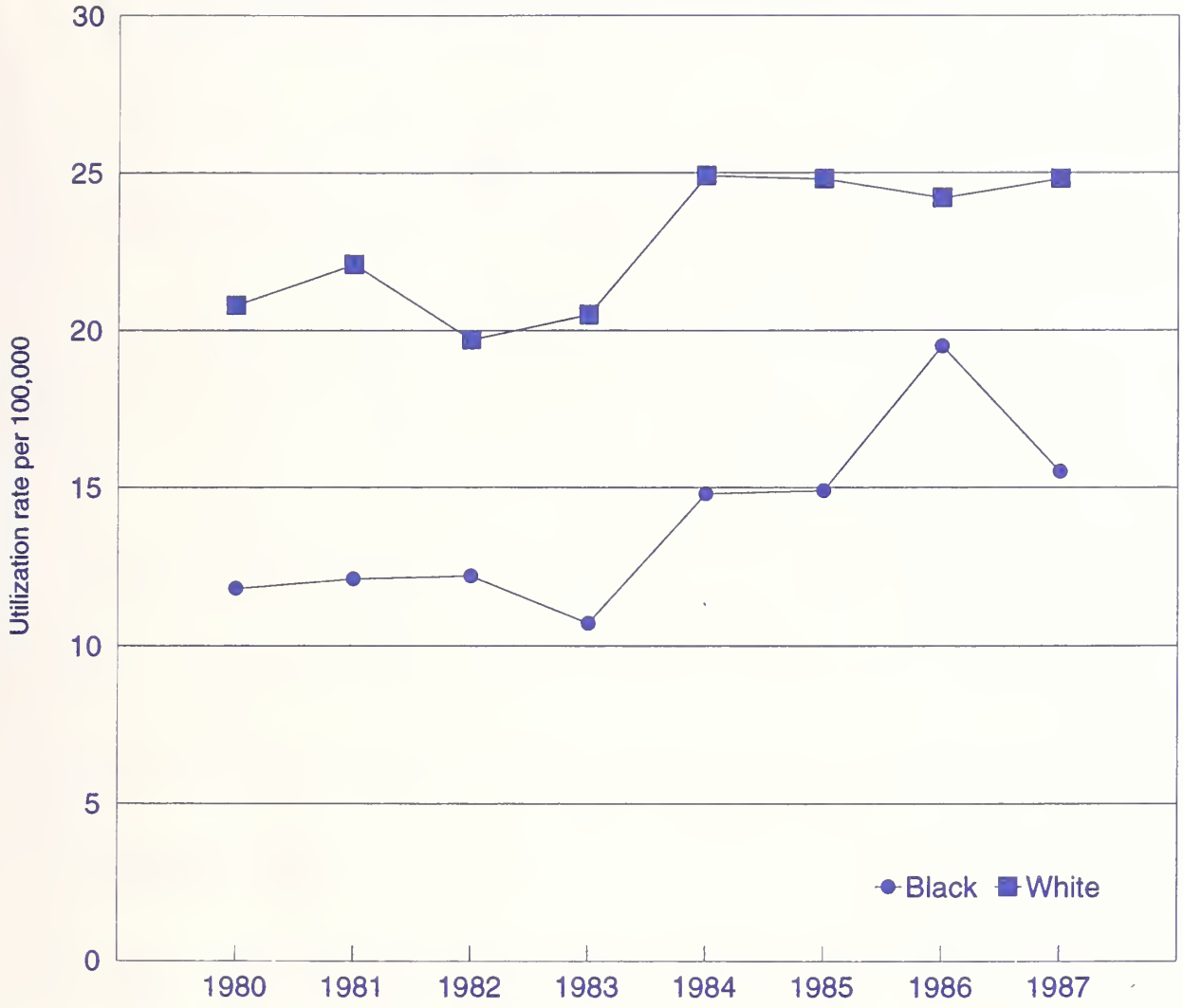
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	9.8 (6.8, 12.9)	10.9 (7.9, 13.8)	9.0 (6.2, 11.9)	11.9 (8.3, 15.4)	11.4 (7.6, 15.2)	7.6 (5.2, 10.1)	8.7 (5.3, 12.1)	9.7 (5.4, 14.0)	–2.1 (–6.5, 2.5)
White	16.2 (14.1, 18.4)	17.7 (15.3, 20.0)	16.7 (14.5, 18.9)	21.0 (17.9, 24.2)	21.9 (17.7, 26.1)	17.7 (14.5, 21.0)	16.5 (12.5, 20.5)	15.1 (11.2, 18.9)	–0.8 (–4.8, 3.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

137. Repair and plastic procedures on bone



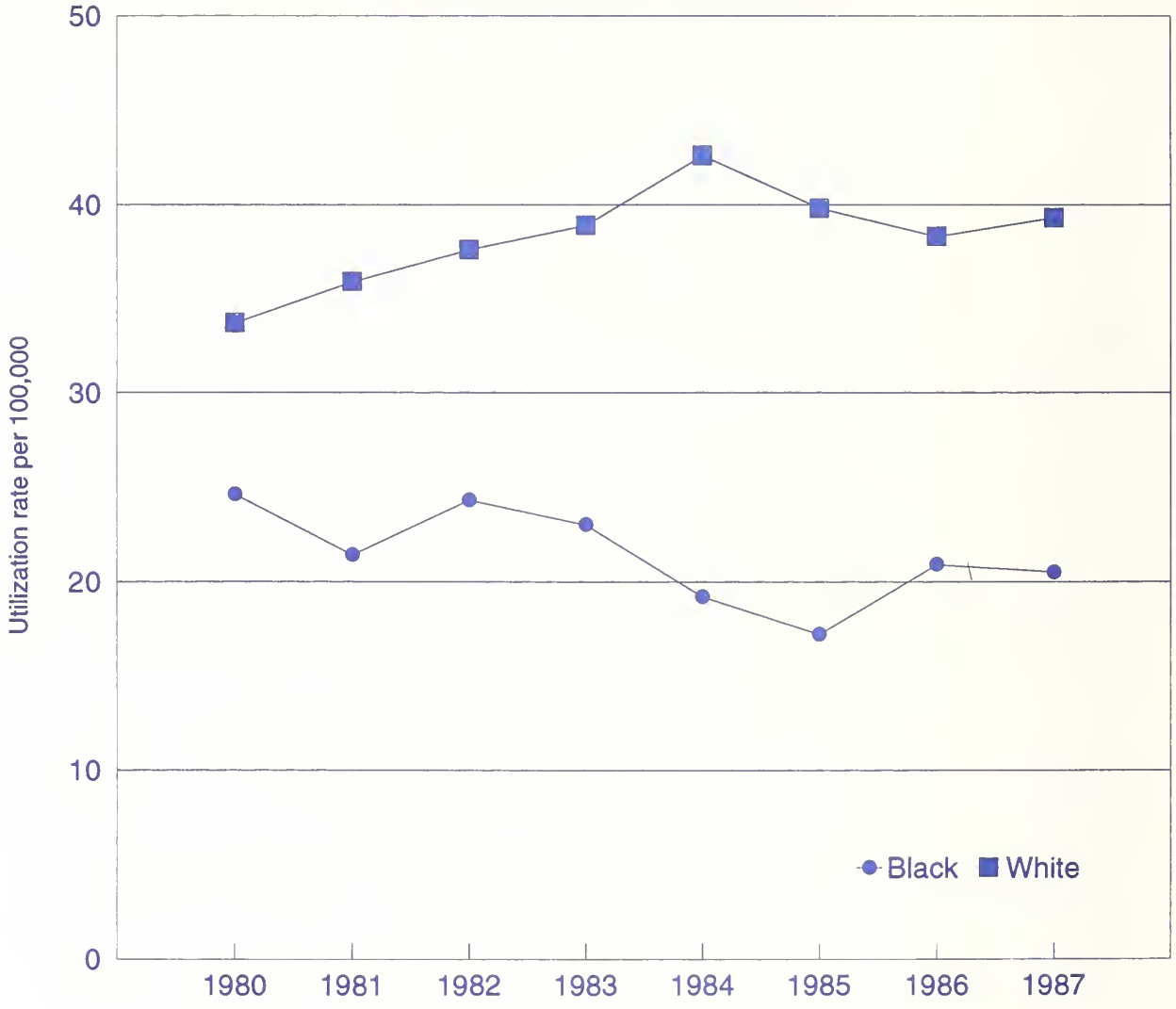
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	11.8 (8.0, 15.6)	12.1 (8.5, 15.7)	12.2 (8.9, 15.4)	10.7 (7.8, 13.7)	14.8 (11.0, 18.5)	14.9 (10.8, 18.9)	19.5 (12.4, 26.5)	15.5 (10.3, 20.8)	6.4 (2.4, 10.7)
White	20.8 (18.5, 23.0)	22.1 (19.9, 24.3)	19.7 (17.8, 21.7)	20.5 (18.2, 22.7)	24.9 (21.4, 28.4)	24.8 (21.7, 27.8)	24.2 (21.5, 26.9)	24.8 (21.9, 27.7)	3.1 (1.0, 5.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

138. Arthroplasty of other joint



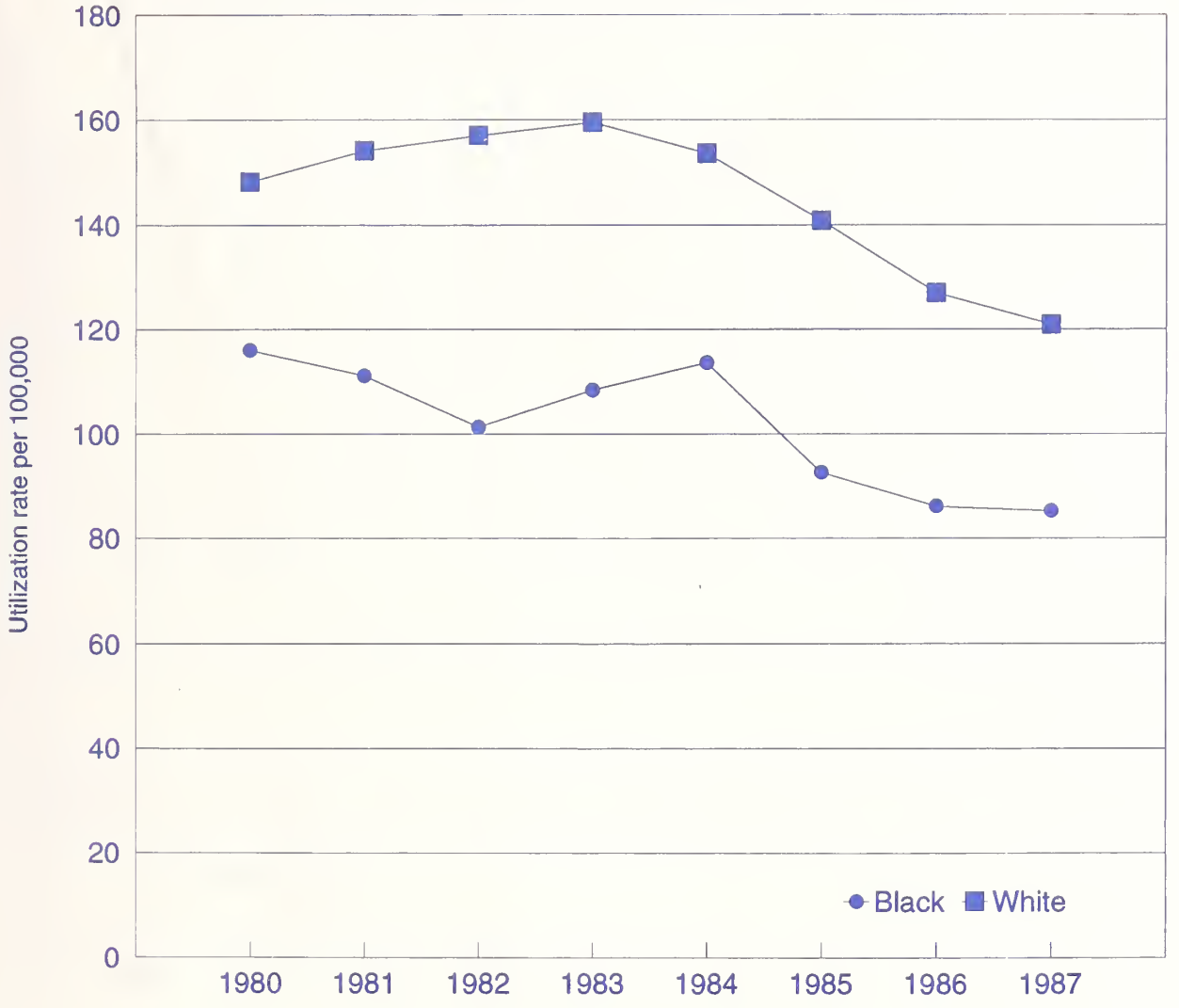
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	24.6 (16.4, 32.8)	21.4 (15.2, 27.6)	24.3 (17.6, 31.0)	23.0 (15.9, 30.2)	19.2 (14.0, 24.5)	17.2 (13.0, 21.3)	20.9 (15.3, 26.5)	20.5 (15.5, 25.5)	−3.1 (−6.0, −0.0)
White	33.7 (29.7, 37.7)	35.9 (31.7, 40.1)	37.6 (33.5, 41.6)	38.9 (34.7, 43.1)	42.6 (38.2, 46.9)	39.8 (35.3, 44.2)	38.3 (33.6, 43.0)	39.3 (33.8, 44.7)	2.0 (0.3, 3.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

139. Other procedures, musculoskeletal system



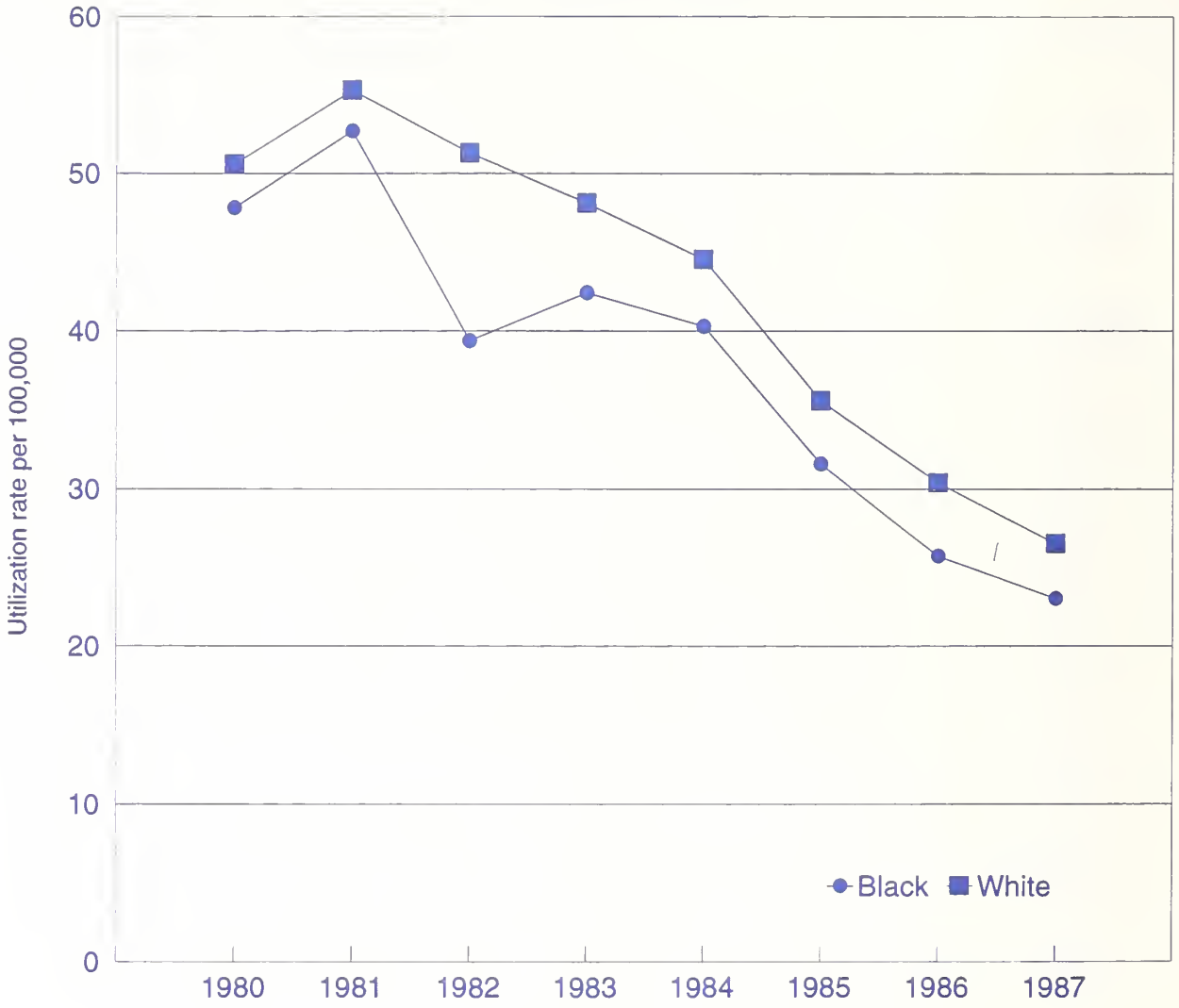
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	116.0 (94.8, 137.3)	111.1 (93.3, 128.9)	101.3 (85.4, 117.1)	108.4 (92.8, 124.0)	113.6 (94.0, 133.1)	92.6 (77.3, 107.8)	86.1 (69.8, 102.5)	85.2 (67.6, 102.9)	−4.3 (−6.3, −2.2)
White	148.2 (136.8, 159.6)	154.1 (141.9, 166.2)	157.0 (144.4, 169.5)	159.5 (147.0, 172.1)	153.6 (141.1, 166.1)	140.8 (127.0, 154.7)	127.0 (114.6, 139.5)	120.9 (107.4, 134.3)	−3.2 (−5.2, −1.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

140. Breast biopsy



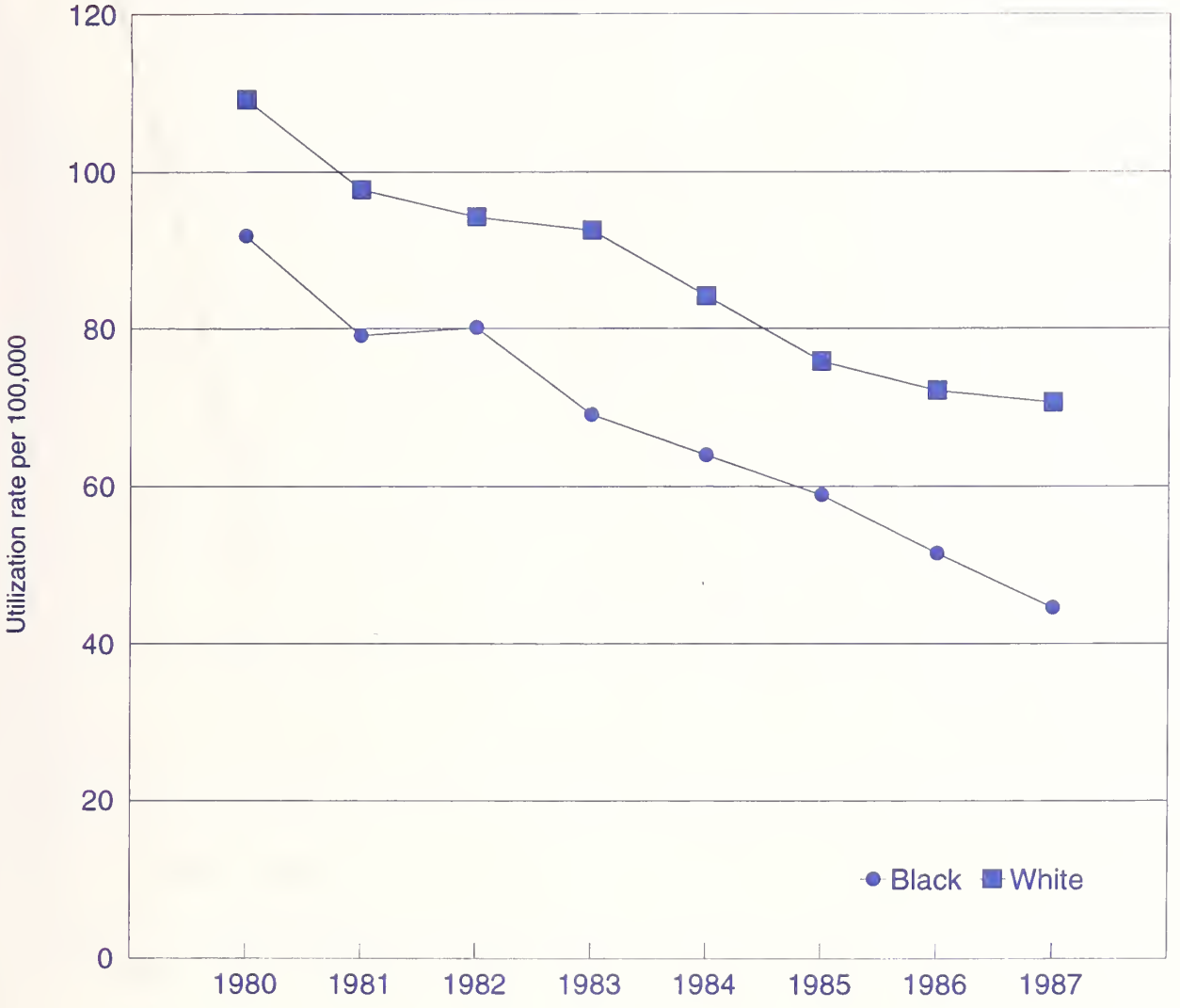
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	47.8	52.7	39.4	42.4	40.3	31.6	25.7	23.0	−10.6
	(37.9, 57.6)	(41.8, 63.7)	(31.5, 47.2)	(33.6, 51.2)	(30.0, 50.5)	(24.0, 39.1)	(17.4, 33.9)	(16.4, 29.6)	(−13.6, −7.5)
White	50.6	55.3	51.3	48.1	44.5	35.6	30.4	26.5	−9.8
	(45.8, 55.3)	(50.0, 60.6)	(46.2, 56.3)	(43.8, 52.4)	(39.9, 49.1)	(30.8, 40.4)	(25.3, 35.5)	(22.0, 31.0)	(−12.6, −6.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

141. Mastectomy, quadrantectomy, lumpectomy



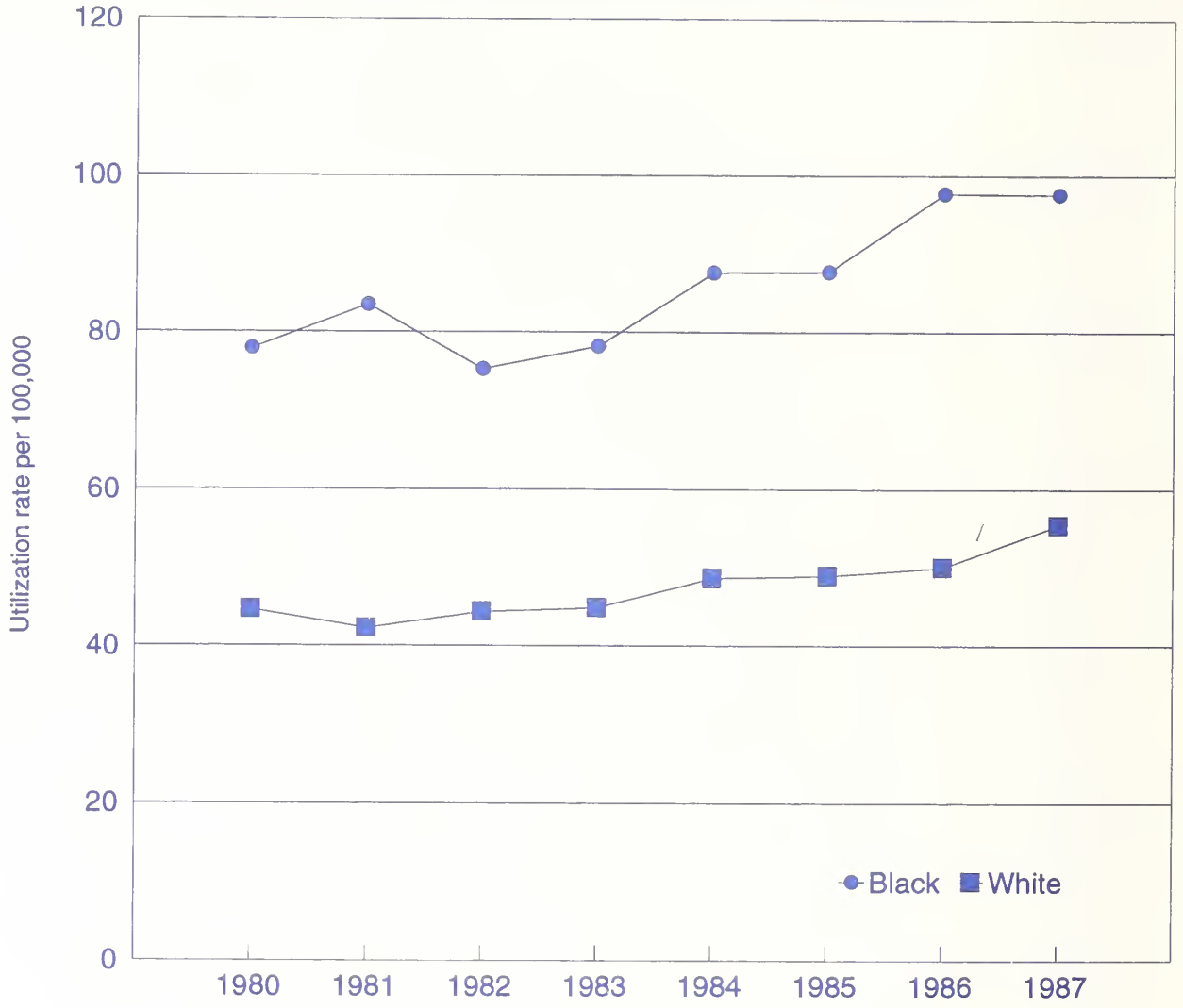
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	91.8 (75.9, 107.7)	79.1 (66.3, 91.9)	80.1 (67.2, 93.1)	69.1 (54.9, 83.3)	64.0 (51.2, 76.8)	58.9 (46.8, 71.1)	51.5 (39.2, 63.8)	44.6 (35.0, 54.2)	–9.3 (–10.4, –8.2)
White	109.2 (100.1, 118.4)	97.7 (90.5, 105.0)	94.2 (87.1, 101.2)	92.5 (85.5, 99.6)	84.1 (78.2, 90.0)	75.8 (70.1, 81.5)	72.1 (66.3, 77.9)	70.6 (64.8, 76.5)	–6.1 (–6.9, –5.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

142. Incision of skin and subcutaneous tissue



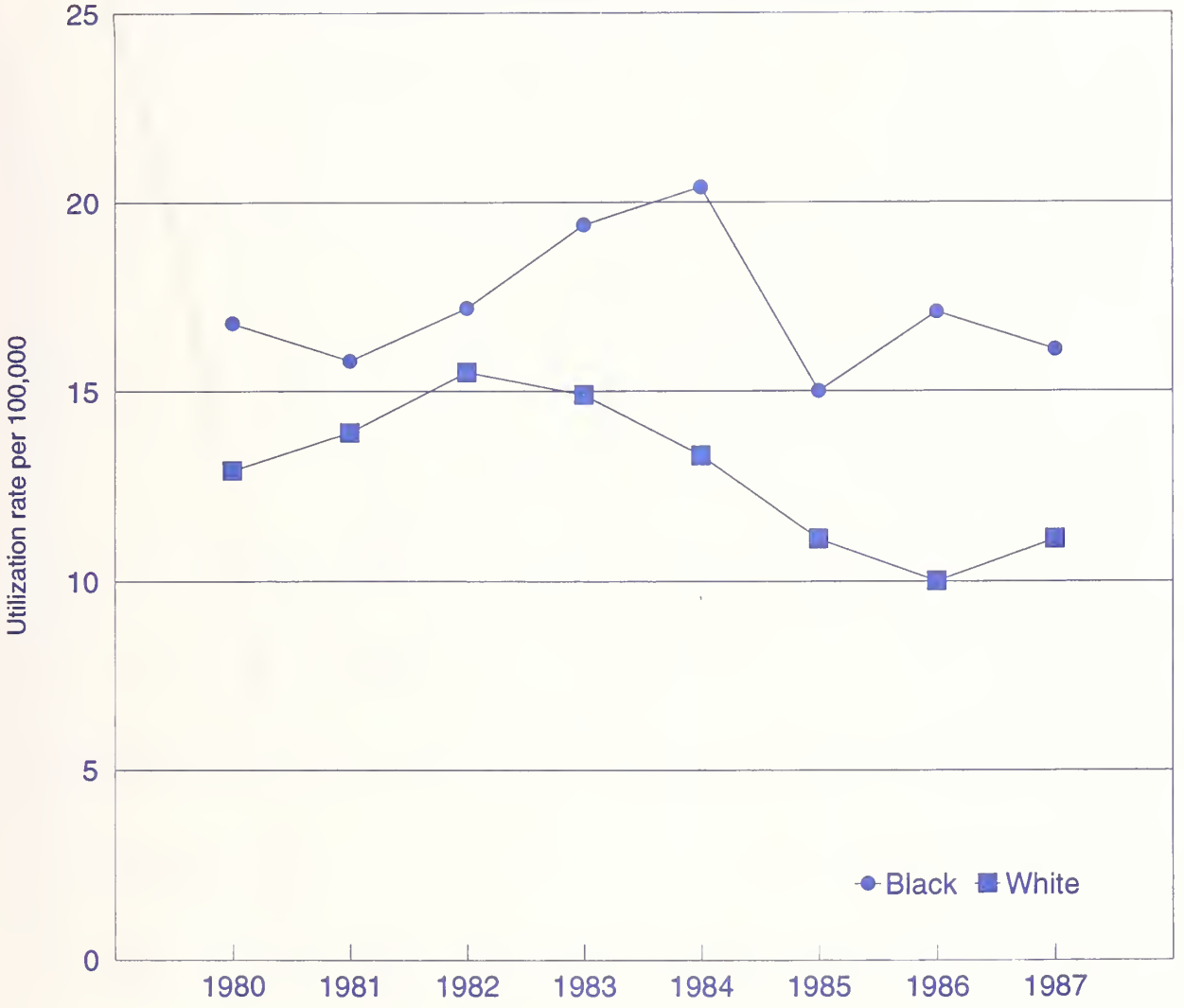
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	77.9 (57.9, 97.9)	83.5 (61.8, 105.2)	75.3 (58.3, 92.4)	78.2 (63.6, 92.9)	87.6 (70.9, 104.4)	87.7 (70.3, 105.2)	97.7 (73.8, 121.5)	97.6 (78.3, 117.0)	3.6 (1.8, 5.3)
White	44.6 (41.3, 47.9)	42.2 (39.3, 45.1)	44.3 (41.2, 47.4)	44.8 (41.2, 48.4)	48.6 (45.0, 52.2)	48.9 (45.2, 52.6)	50.0 (46.0, 54.0)	55.4 (51.3, 59.6)	3.3 (2.1, 4.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

143. Diagnostic procedure, skin and subcutaneous tissue



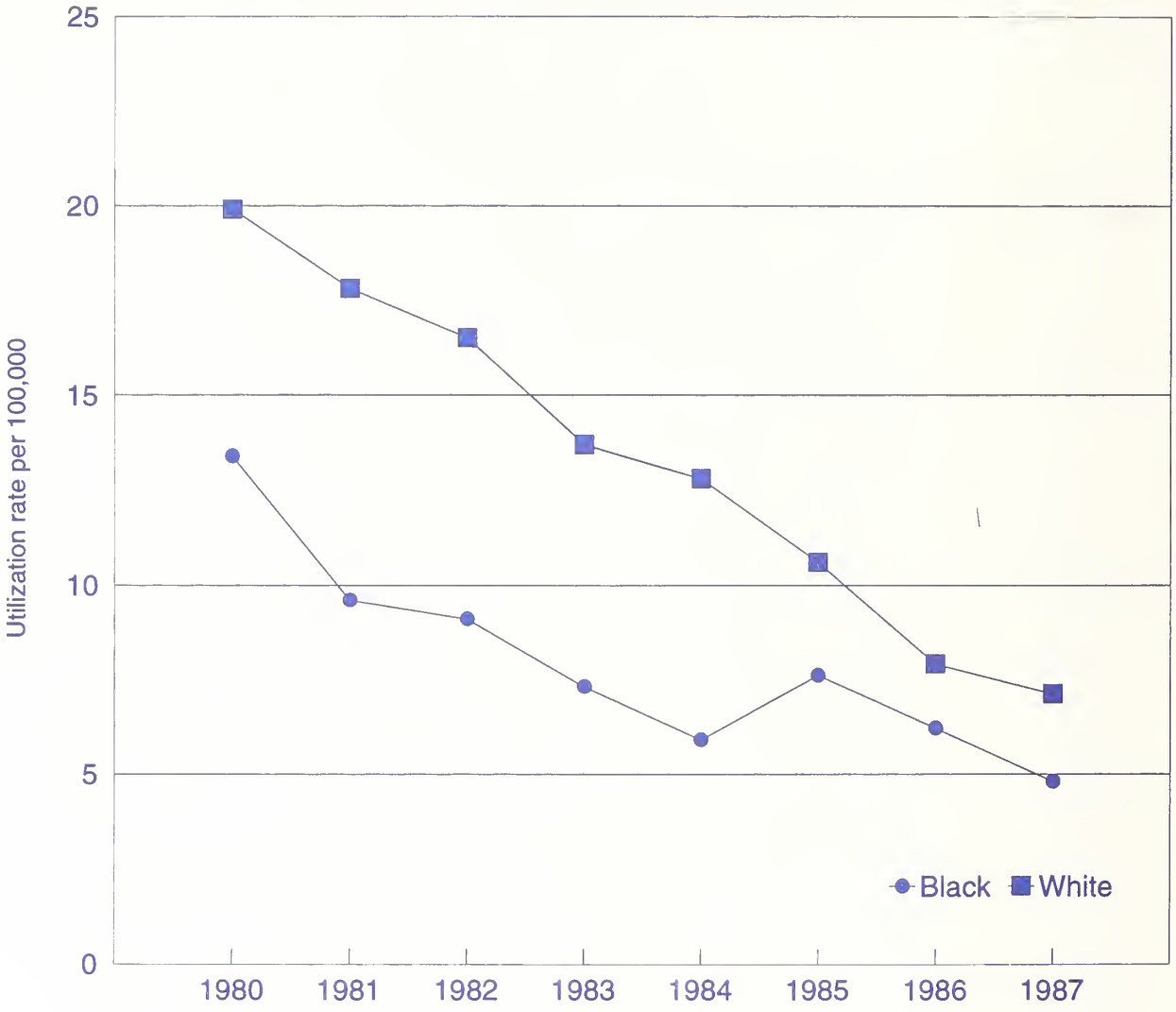
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	16.8 (11.4, 22.2)	15.8 (11.4, 20.2)	17.2 (12.5, 21.9)	19.4 (12.9, 25.8)	20.4 (14.7, 26.1)	15.0 (10.8, 19.2)	17.1 (11.7, 22.5)	16.1 (12.0, 20.2)	–0.3 (–3.6, 3.1)
White	12.9 (11.3, 14.5)	13.9 (12.4, 15.3)	15.5 (13.7, 17.3)	14.9 (13.2, 16.7)	13.3 (11.8, 14.8)	11.1 (9.6, 12.6)	10.0 (8.7, 11.4)	11.1 (9.3, 12.9)	–4.4 (–7.7, –1.0)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

144. Excision of pilonidal cyst



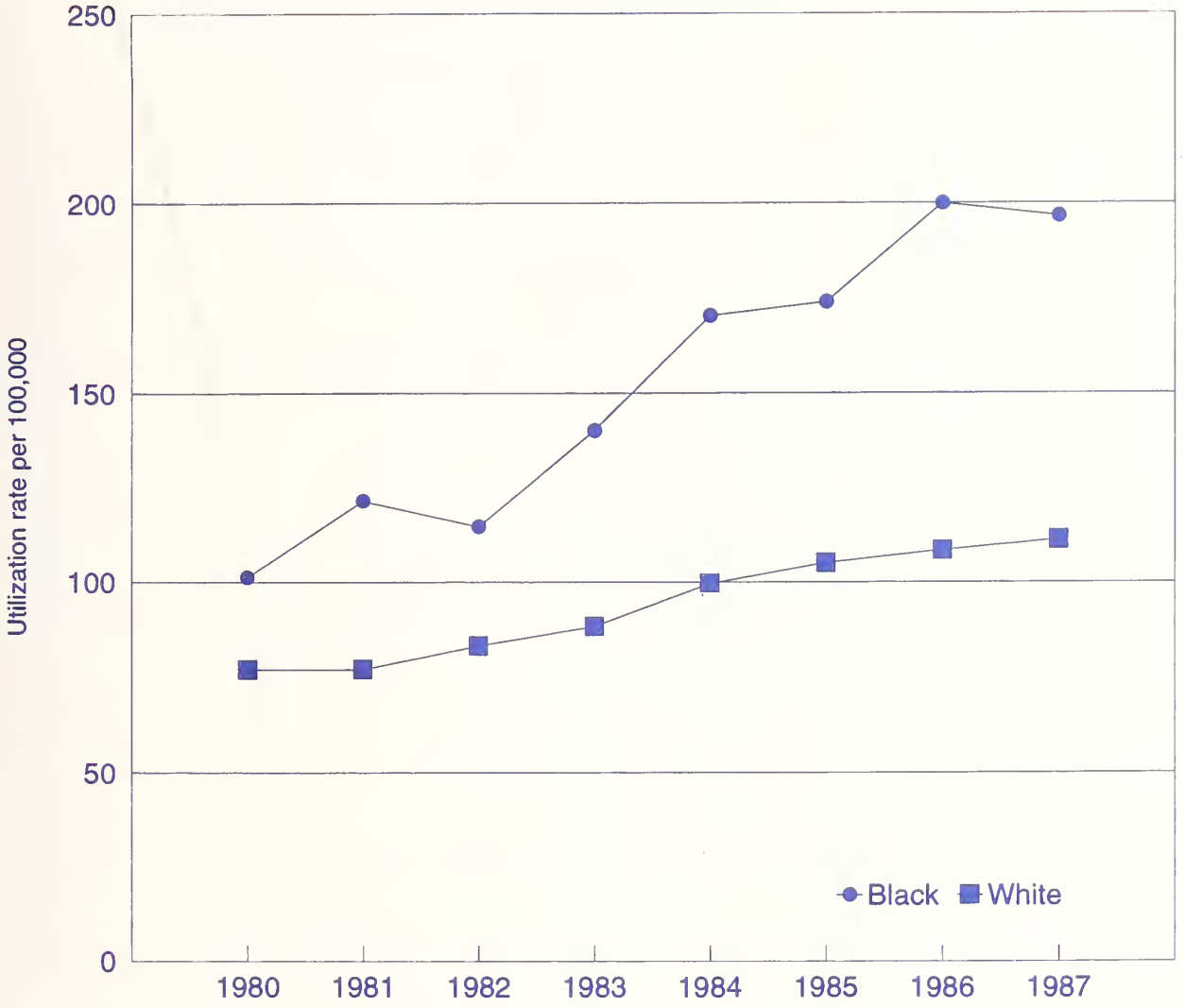
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	13.4	9.6	9.1	7.3	5.9	7.6	6.2	4.8	−11.3
	(8.6,	(7.0,	(6.7,	(4.9,	(3.8,	(5.3,	(4.1,	(2.8,	(−15.0,
	18.1)	12.1)	11.5)	9.8)	8.0)	9.9)	8.4)	6.7)	−7.5)
White	19.9	17.8	16.5	13.7	12.8	10.6	7.9	7.1	−14.0
	(18.0,	(16.1,	(14.9,	(12.3,	(11.0,	(9.4,	(6.9,	(5.9,	(−15.8,
	21.8)	19.5)	18.2)	15.1)	14.6)	11.8)	9.0)	8.2)	−12.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

145. Debridement of wound



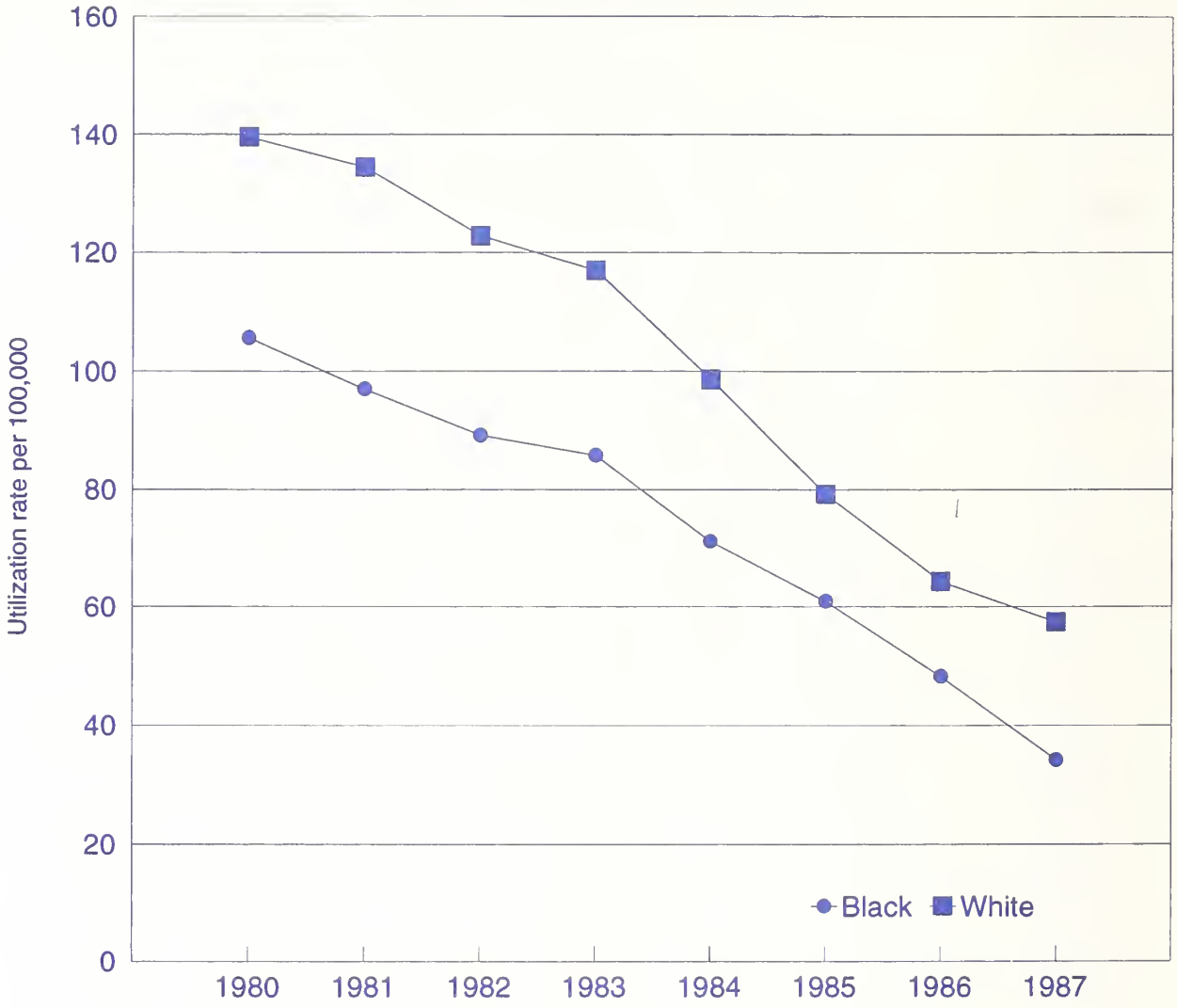
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	101.2 (81.9, 120.4)	121.4 (96.4, 146.4)	114.6 (88.4, 140.8)	140.1 (115.8, 164.3)	170.4 (141.3, 199.5)	174.0 (143.3, 204.7)	199.9 (158.0, 241.7)	196.6 (155.1, 238.1)	10.8 (8.4, 13.2)
White	77.0 (70.8, 83.2)	77.1 (70.6, 83.6)	83.2 (76.1, 90.2)	88.3 (81.5, 95.2)	99.6 (92.2, 107.0)	105.1 (96.9, 113.3)	108.4 (100.3, 116.5)	111.2 (102.3, 120.1)	6.3 (5.2, 7.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

146. Excision of skin lesion



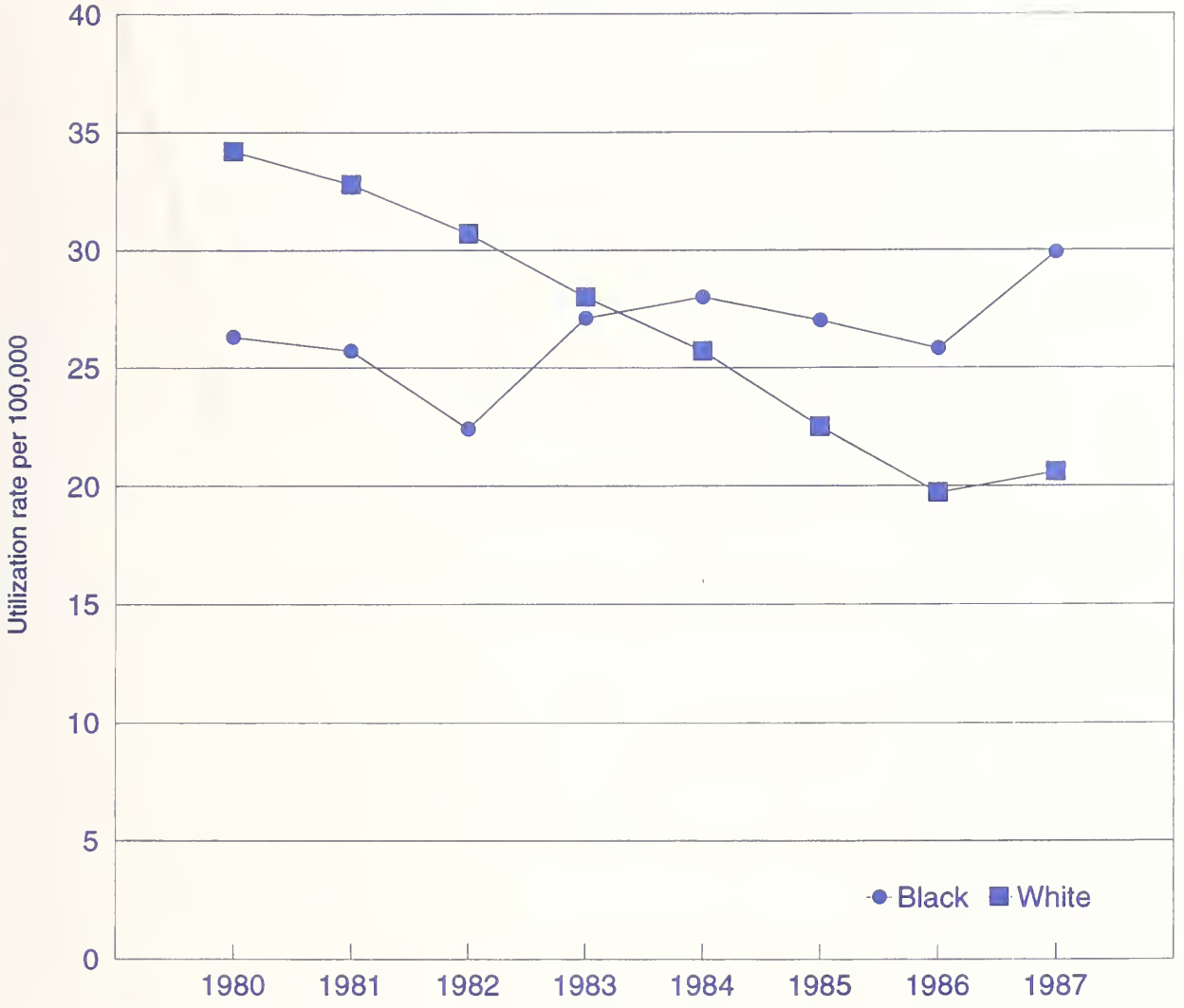
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	105.6	97.0	89.2	85.8	71.1	60.9	48.2	34.2	−14.0
	(85.1,	(81.1,	(74.6,	(69.8,	(54.8,	(49.9,	(38.6,	(27.5,	(−17.1,
	126.0)	112.9)	103.8)	101.9)	87.4)	72.0)	57.9)	40.9)	−10.9)
White	139.5	134.4	122.8	116.9	98.6	79.2	64.3	57.4	−12.7
	(129.1,	(124.9,	(114.0,	(105.5,	(89.5,	(69.3,	(53.9,	(47.2,	(−14.9,
	149.8)	143.8)	131.5)	128.3)	107.7)	89.2)	74.7)	67.7)	−10.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

147. Other excision of skin and subcutaneous tissue



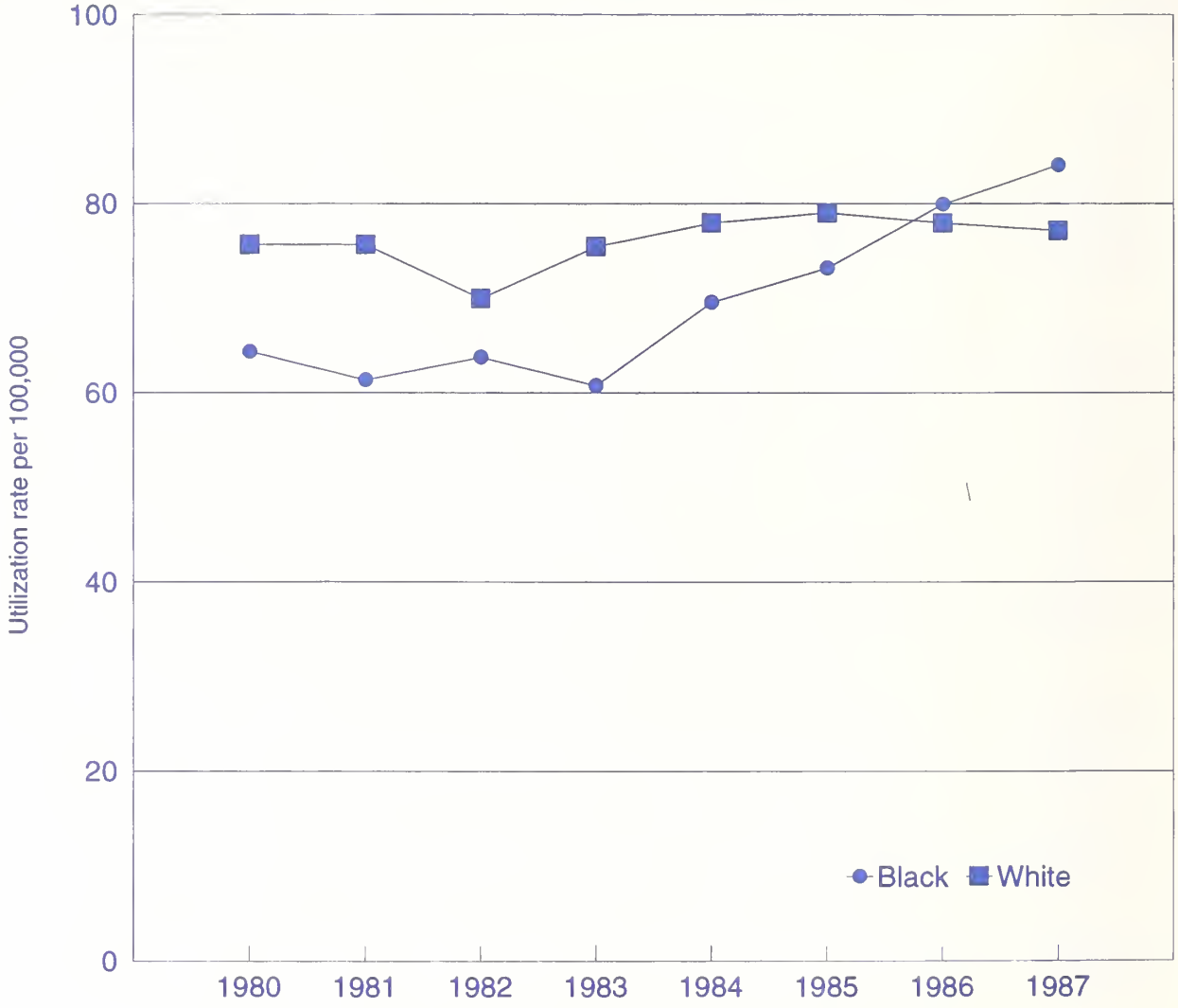
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	26.3 (19.9, 32.7)	25.7 (20.6, 30.8)	22.4 (16.5, 28.3)	27.1 (21.5, 32.7)	28.0 (22.1, 33.9)	27.0 (21.5, 32.6)	25.8 (19.3, 32.3)	29.9 (22.1, 37.7)	1.8 (–0.5, 4.2)
White	34.2 (30.9, 37.5)	32.8 (30.0, 35.6)	30.7 (27.8, 33.6)	28.0 (25.1, 30.9)	25.7 (23.3, 28.1)	22.5 (19.5, 25.4)	19.7 (16.4, 22.9)	20.6 (17.2, 24.0)	–8.2 (–9.4, –6.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

148. Suture of skin and subcutaneous tissue



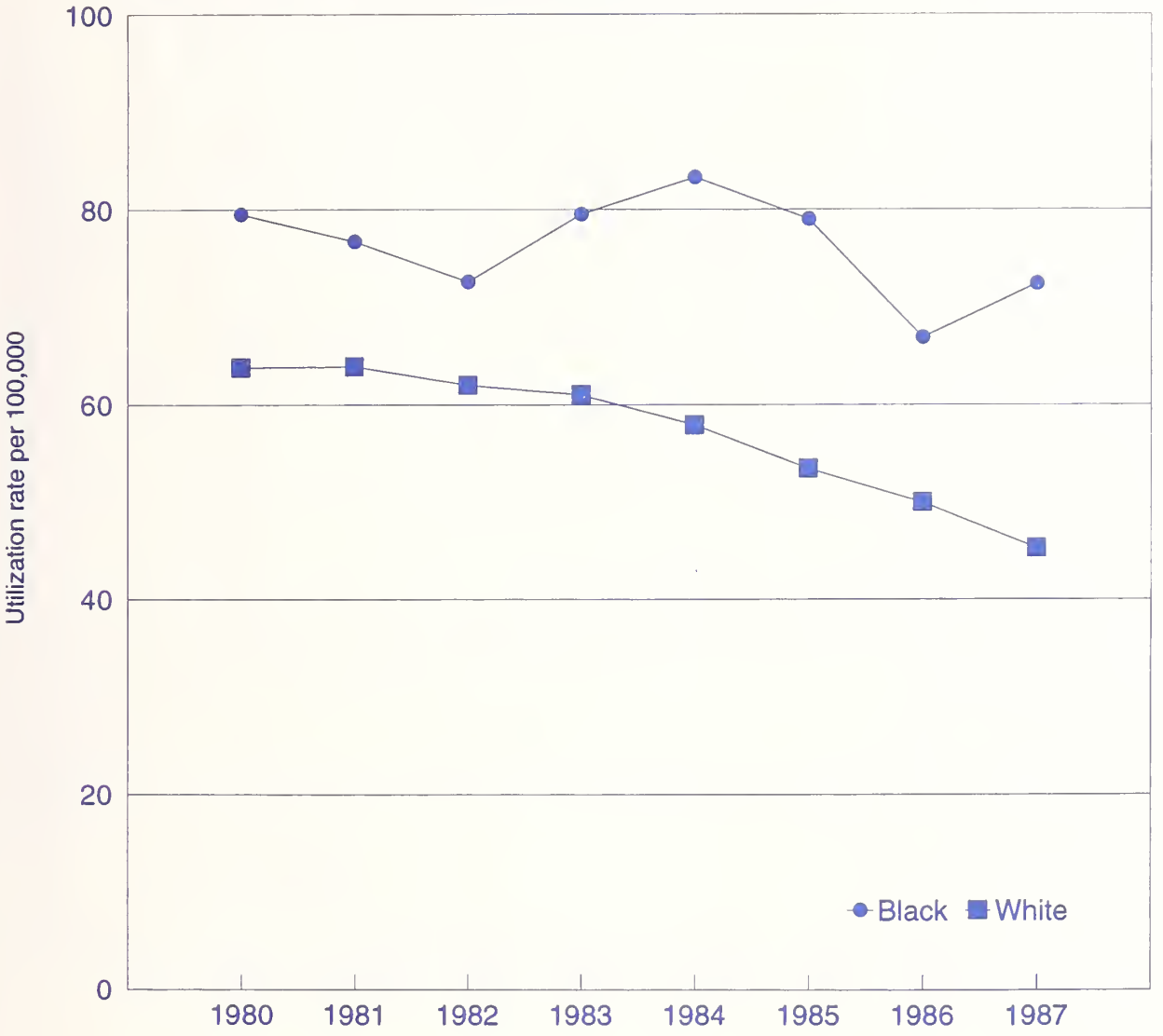
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	64.3 (53.2, 75.4)	61.3 (50.4, 72.3)	63.7 (50.3, 77.1)	60.7 (48.9, 72.5)	69.5 (56.9, 82.2)	73.1 (59.8, 86.5)	79.9 (61.3, 98.4)	84.1 (61.9, 106.3)	4.6 (2.7, 6.5)
White	75.6 (69.7, 81.5)	75.6 (69.7, 81.4)	69.9 (64.7, 75.0)	75.4 (69.4, 81.4)	77.9 (71.9, 83.8)	79.0 (72.7, 85.4)	77.9 (71.5, 84.3)	77.1 (69.8, 84.4)	0.8 (–0.2, 1.9)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

149. Skin graft



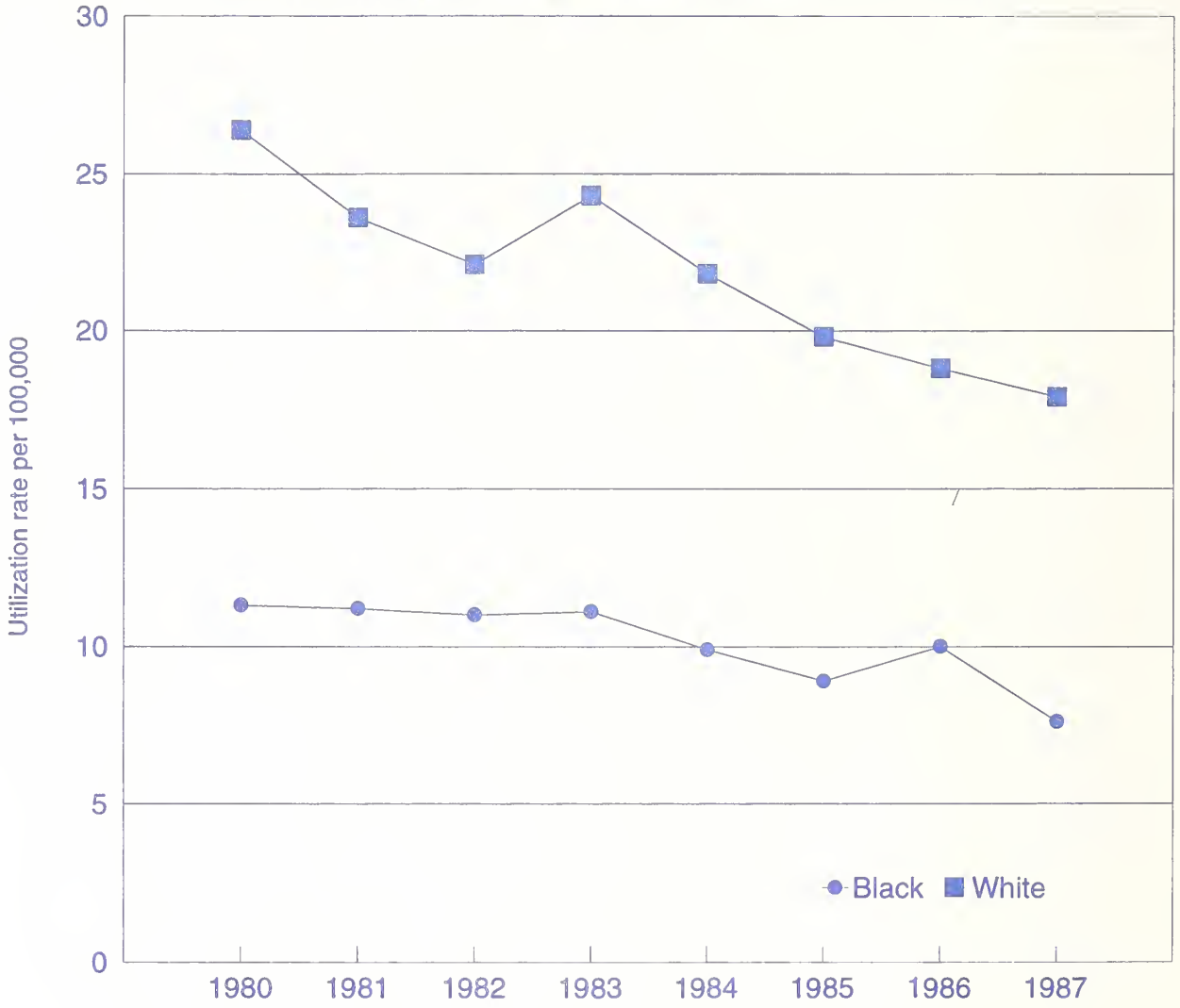
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	79.5 (63.0, 96.1)	76.7 (61.4, 92.0)	72.6 (59.1, 86.1)	79.5 (65.0, 94.1)	83.3 (68.3, 98.4)	79.0 (65.0, 92.9)	66.9 (54.0, 79.9)	72.4 (53.4, 91.5)	–1.2 (–3.3, 0.8)
White	63.8 (58.2, 69.3)	63.9 (57.7, 70.1)	62.0 (56.6, 67.4)	61.0 (55.5, 66.5)	57.9 (52.7, 63.0)	53.4 (47.6, 59.1)	49.9 (44.1, 55.6)	45.2 (40.1, 50.4)	–4.8 (–6.0, –3.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

150. Other repair of skin and subcutaneous tissue



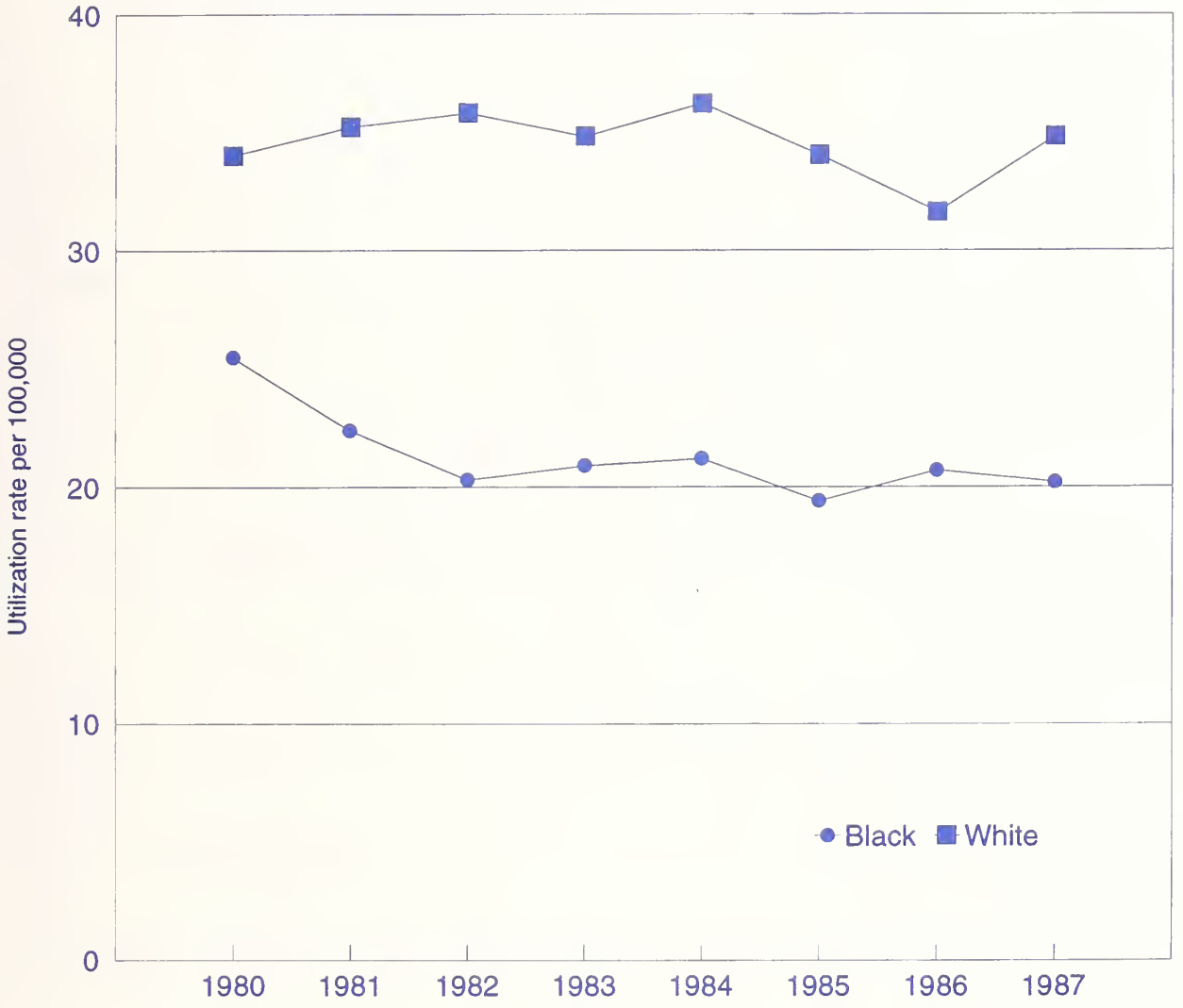
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	11.3 (7.9, 14.6)	11.2 (7.9, 14.5)	11.0 (8.1, 13.9)	11.1 (7.7, 14.5)	9.9 (7.3, 12.5)	8.9 (6.4, 11.4)	10.0 (6.8, 13.3)	7.6 (4.5, 10.7)	–4.7 (–7.0, –2.4)
White	26.4 (22.1, 30.8)	23.6 (20.3, 26.8)	22.1 (18.9, 25.3)	24.3 (20.8, 27.8)	21.8 (18.8, 24.7)	19.8 (17.5, 22.1)	18.8 (16.0, 21.7)	17.9 (15.4, 20.3)	–5.0 (–6.4, –3.6)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

151. Other procedures on skin and breast



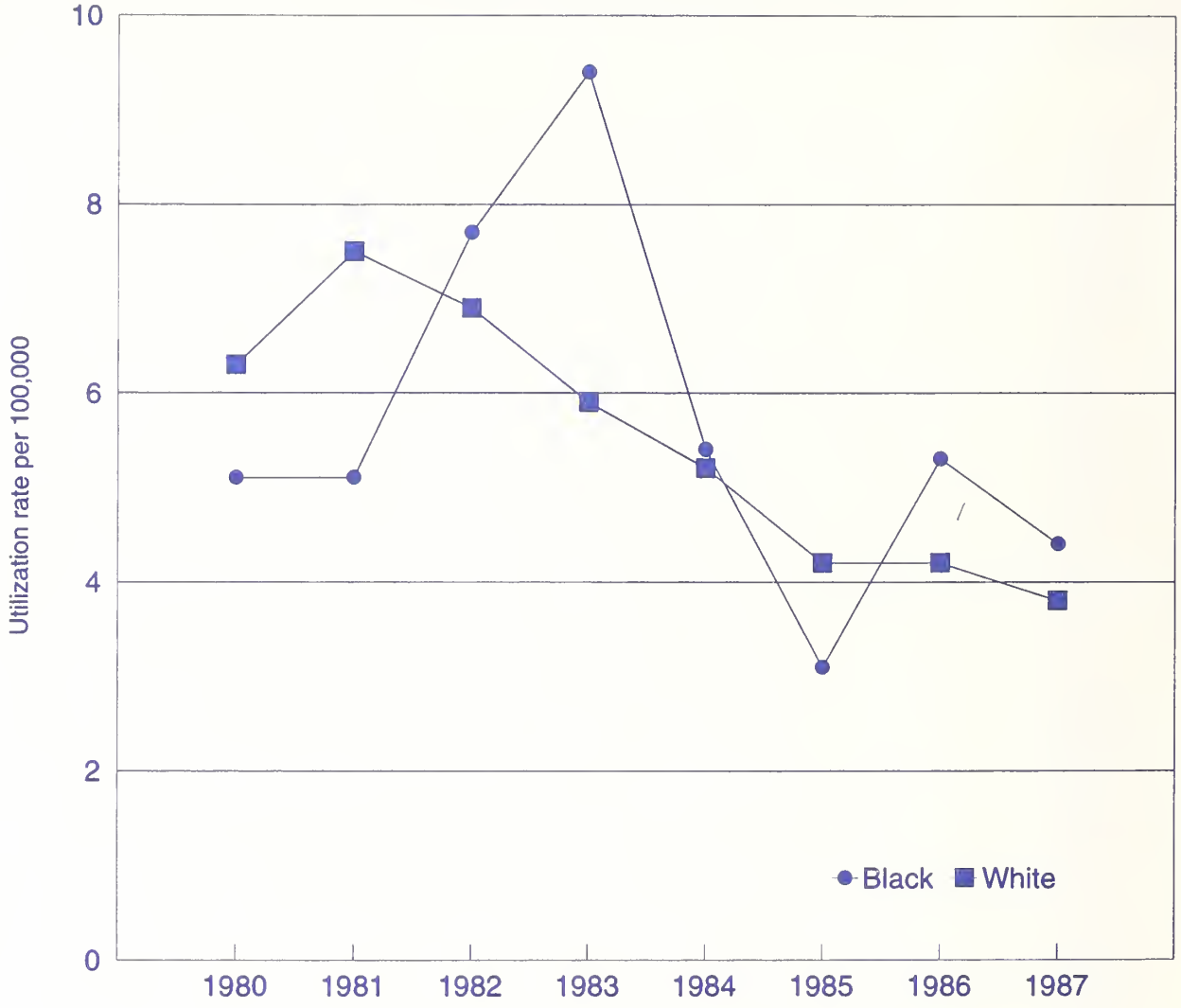
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	25.5	22.4	20.3	20.9	21.2	19.4	20.7	20.2	−2.5
	(18.9,	(17.2,	(15.7,	(15.8,	(14.7,	(14.6,	(14.2,	(14.4,	(−4.3,
	32.1)	27.7)	24.9)	26.1)	27.8)	24.3)	27.2)	25.9)	−0.7)
White	34.0	35.2	35.8	34.8	36.2	34.0	31.6	34.8	−0.6
	(27.5,	(29.2,	(30.2,	(30.7,	(31.1,	(29.8,	(27.4,	(30.5,	(−1.9,
	40.5)	41.1)	41.4)	39.0)	41.3)	38.2)	35.8)	39.1)	0.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

152. Encephalogram



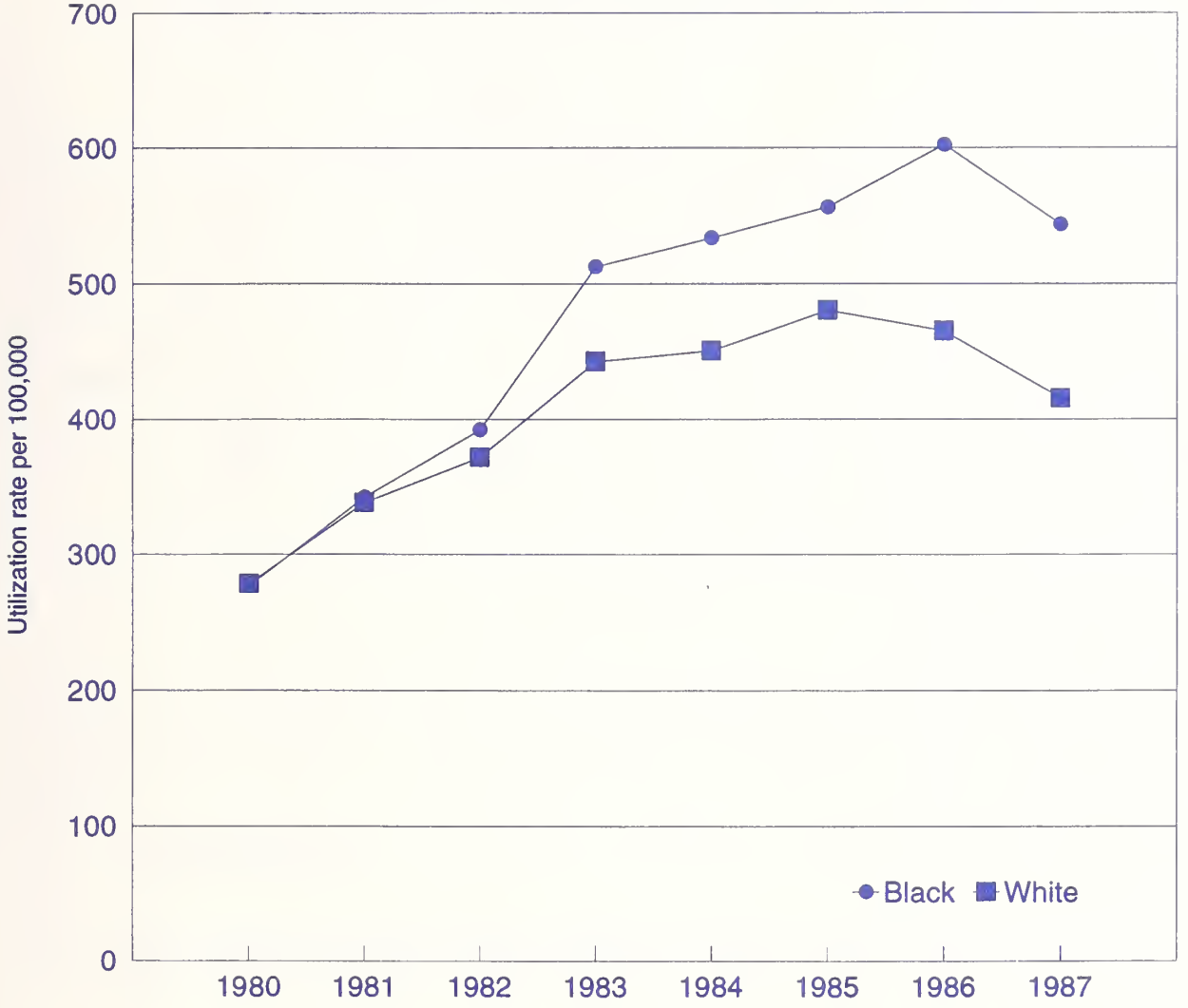
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	5.1 (2.6, 7.5)	5.1 (0.6, 9.7)	7.7 (2.6, 12.7)	9.4 (3.5, 15.4)	5.4 (1.7, 9.2)	3.1 (0.3, 6.0)	5.3 (0.0, 10.7)	4.4 (0.0, 10.1)	–4.7 (–13.9, 5.5)
White	6.3 (3.4, 9.2)	7.5 (2.4, 12.5)	6.9 (2.2, 11.5)	5.9 (2.0, 9.8)	5.2 (1.2, 9.2)	4.2 (0.6, 7.8)	4.2 (0.1, 8.3)	3.8 (0.1, 7.5)	–9.1 (–11.9, –6.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

153. Computerized axial tomography (CAT) scan, head



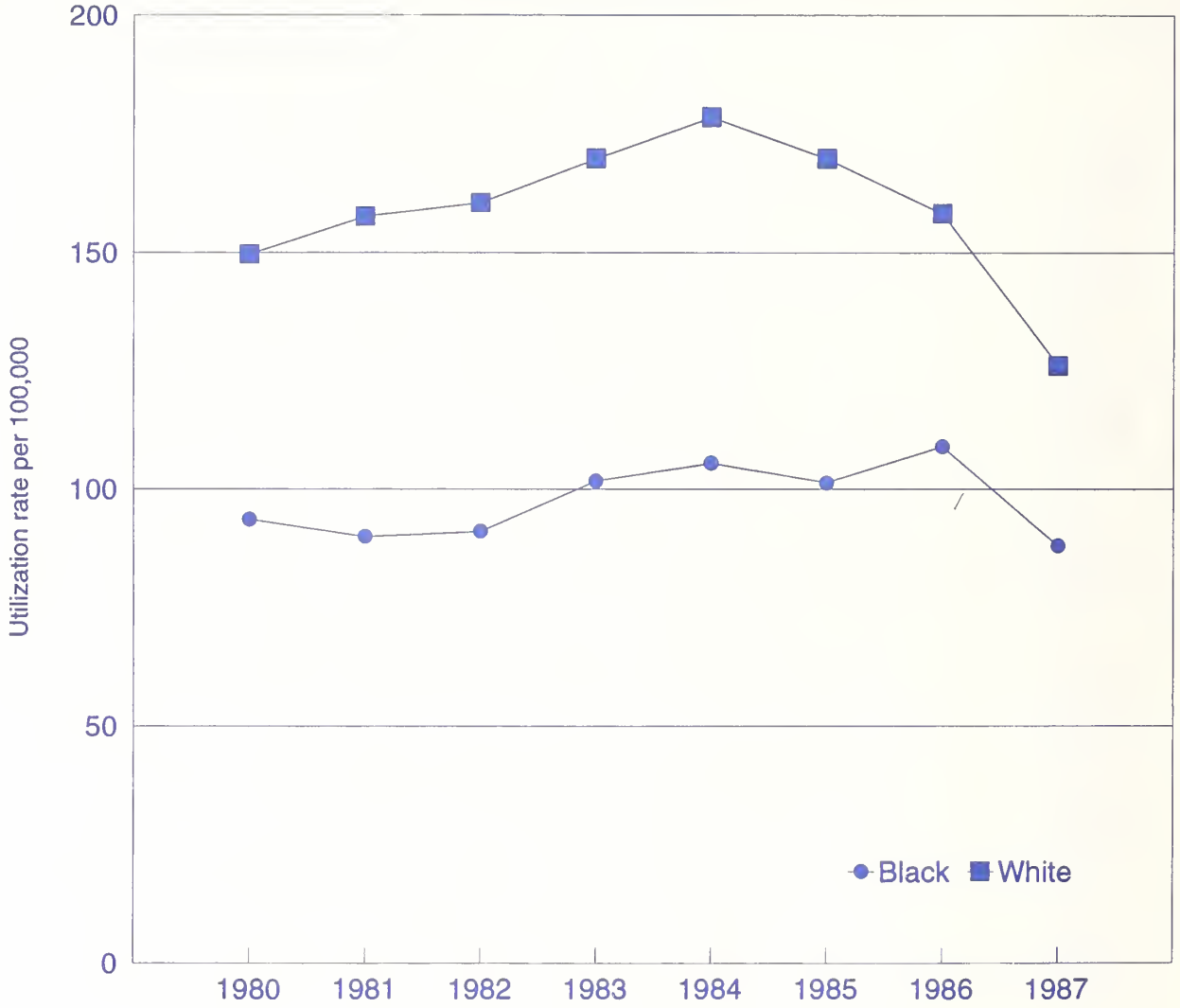
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	276.4 (215.7, 337.0)	342.0 (274.5, 409.4)	392.2 (317.1, 467.3)	512.4 (412.7, 612.2)	533.5 (423.7, 643.3)	556.1 (448.5, 663.6)	602.1 (451.2, 752.9)	543.4 (414.1, 672.7)	10.8 (6.7, 15.2)
White	278.0 (237.2, 318.9)	338.0 (294.3, 381.7)	371.6 (328.5, 414.7)	442.7 (393.3, 492.0)	450.6 (401.2, 500.1)	480.3 (425.7, 534.9)	465.1 (413.7, 516.5)	415.6 (364.0, 467.1)	6.4 (2.6, 10.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

154. Myelogram



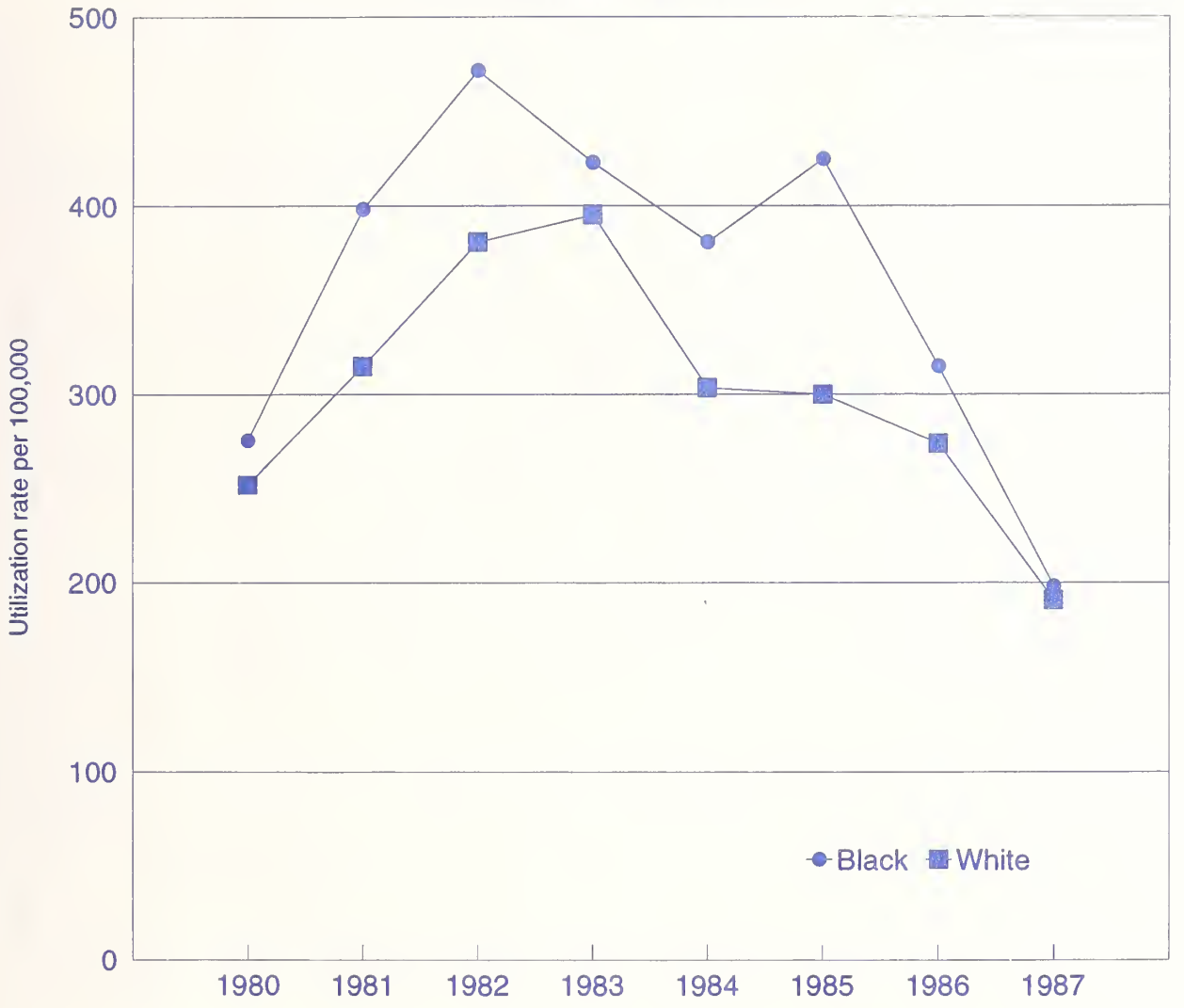
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	93.6 (72.6, 114.7)	90.0 (70.7, 109.4)	91.1 (74.5, 107.8)	101.7 (84.1, 119.4)	105.4 (86.9, 123.8)	101.3 (82.4, 120.2)	108.9 (85.1, 132.7)	88.0 (69.1, 107.0)	1.0 (–1.4, 3.6)
White	149.6 (130.6, 168.6)	157.6 (138.8, 176.5)	160.5 (140.0, 181.0)	169.8 (153.0, 186.6)	178.5 (160.4, 196.6)	169.8 (151.4, 188.2)	158.2 (139.0, 177.4)	125.9 (110.2, 141.7)	–1.1 (–4.4, 2.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

155. Routine chest x ray



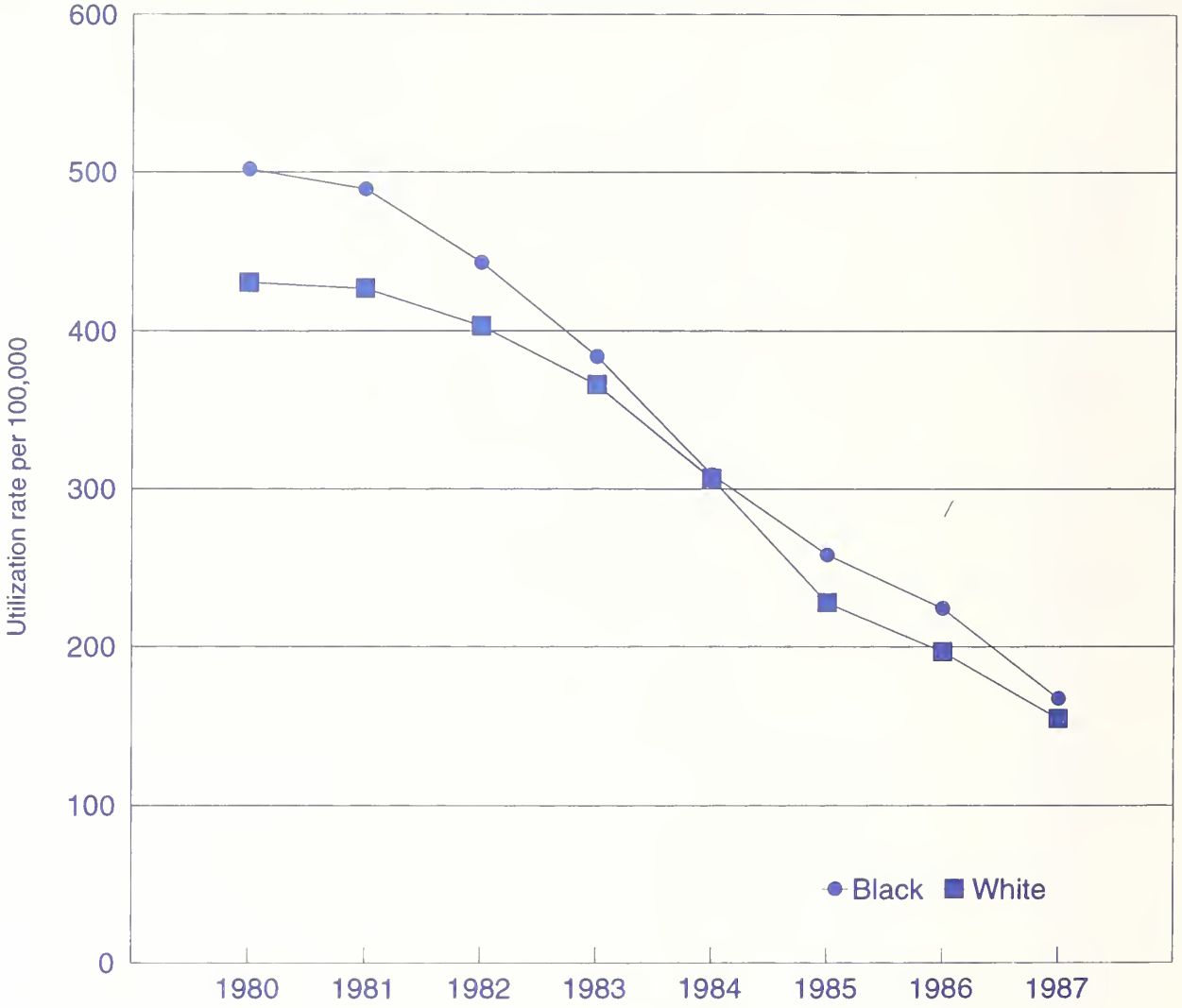
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	275.4 (53.3, 497.5)	398.2 (112.6, 683.7)	471.4 (172.1, 770.6)	422.8 (179.5, 666.1)	380.7 (163.8, 597.5)	424.7 (171.7, 677.6)	314.8 (79.7, 549.9)	198.1 (12.8, 383.5)	–4.5 (–12.4, 4.1)
White	251.8 (123.3, 380.2)	314.6 (159.5, 469.6)	380.8 (206.2, 555.5)	395.2 (230.9, 559.5)	303.3 (183.2, 423.4)	299.8 (166.2, 433.4)	273.7 (143.6, 403.8)	190.7 (89.0, 292.3)	–4.2 (–10.5, 2.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

156. Upper gastrointestinal x ray



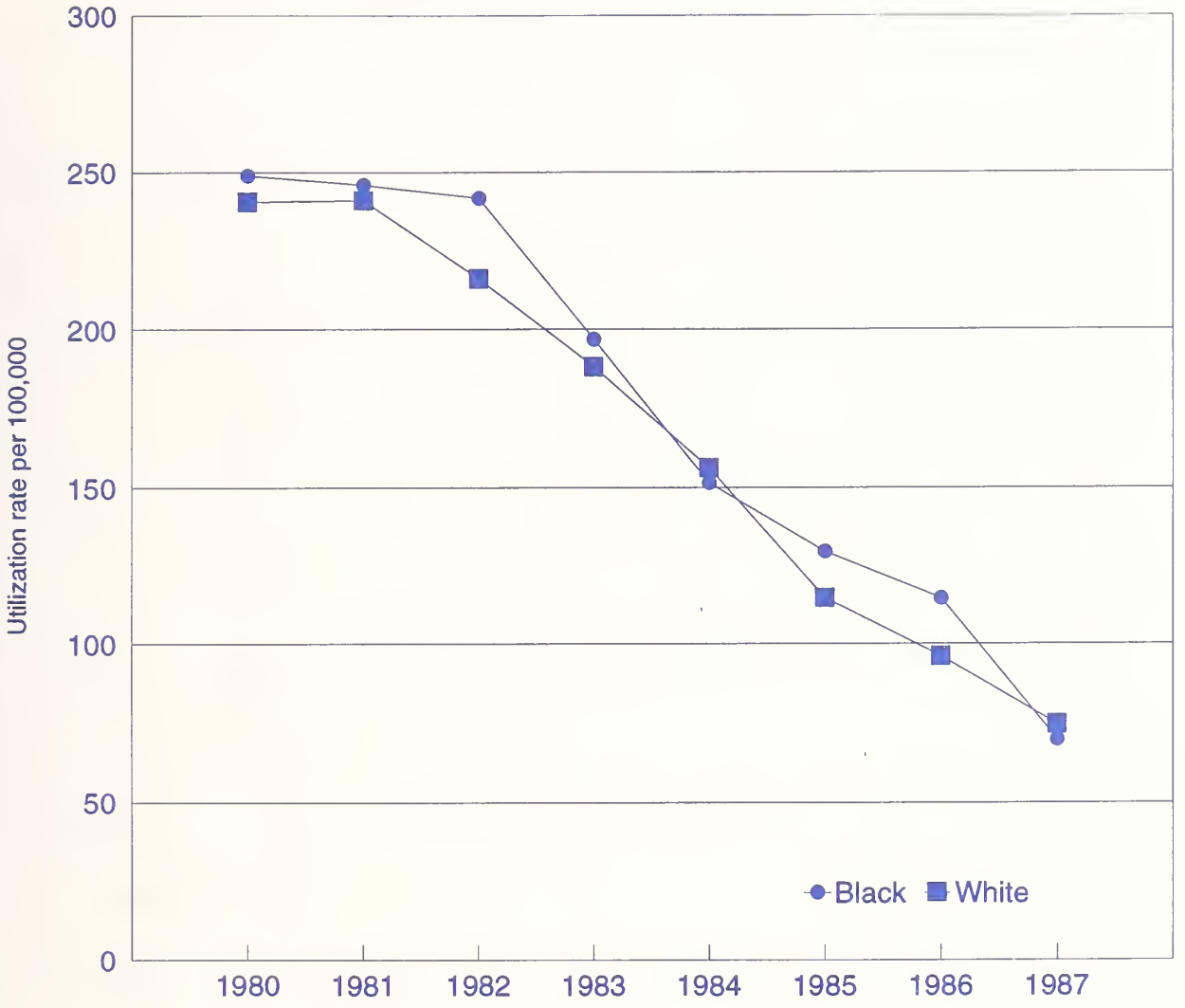
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	501.8	489.2	442.9	383.9	309.0	257.9	224.1	167.2	−14.8
	(372.4,	(373.7,	(330.2,	(304.7,	(246.4,	(202.8,	(164.1,	(120.5,	(−16.9,
	631.3)	604.8)	555.6)	463.1)	371.6)	313.0)	284.0)	213.8)	−12.6)
White	430.4	426.7	403.1	366.0	306.3	227.6	196.8	154.5	−14.3
	(371.2,	(369.6,	(349.0,	(319.7,	(268.1,	(196.2,	(167.5,	(128.1,	(−17.2,
	489.6)	483.9)	457.1)	412.4)	344.5)	258.9)	226.1)	180.9)	−11.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

157. Lower gastrointestinal x ray



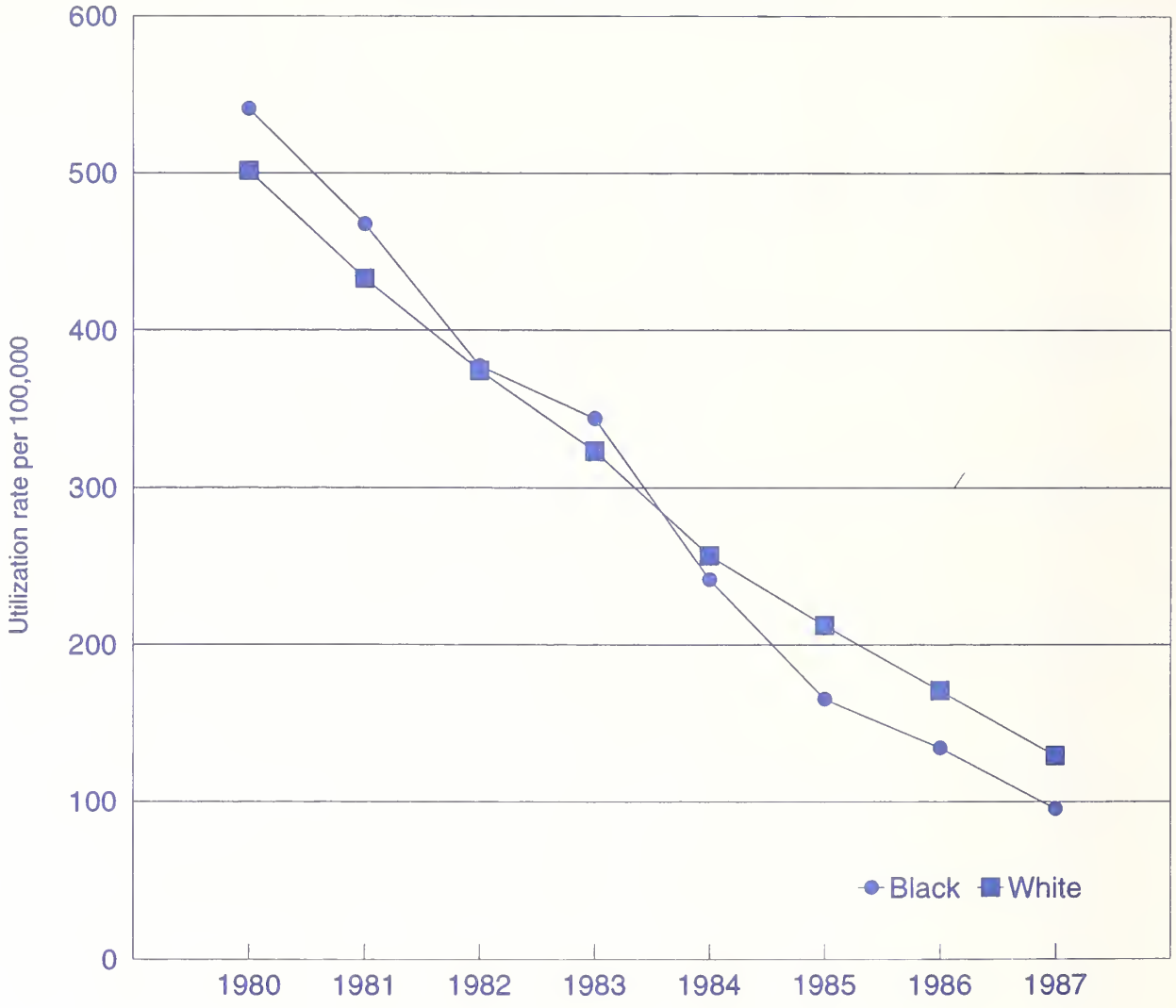
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	248.9 (180.2, 317.6)	246.0 (185.2, 306.7)	241.7 (166.3, 317.1)	196.8 (144.4, 249.2)	151.5 (116.7, 186.3)	129.5 (95.5, 163.6)	114.5 (78.8, 150.1)	69.7 (47.2, 92.3)	−16.2 (−19.8, −12.4)
White	240.5 (203.4, 277.6)	241.0 (204.1, 277.9)	216.1 (182.6, 249.6)	188.2 (160.2, 216.3)	156.2 (133.3, 179.1)	114.6 (96.0, 133.2)	96.0 (79.4, 112.6)	74.6 (60.2, 89.0)	−16.2 (−19.0, −13.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

158. Intravenous pyelogram



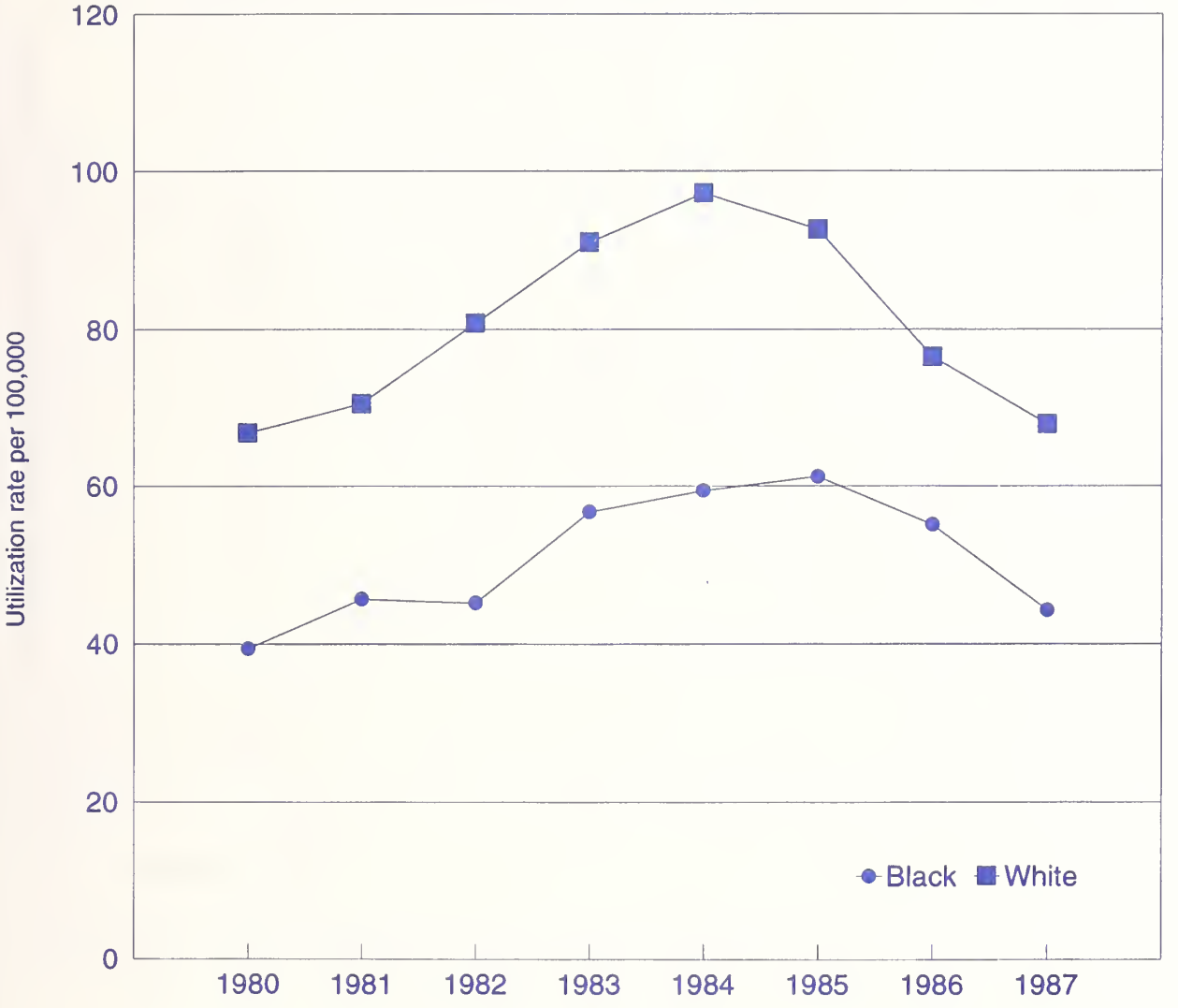
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	541.1 (426.4, 655.8)	467.6 (358.3, 577.0)	377.3 (286.9, 467.7)	343.9 (275.3, 412.5)	241.7 (197.4, 286.0)	165.2 (132.2, 198.2)	134.2 (104.8, 163.6)	95.3 (72.7, 117.9)	−22.3 (−24.8, −19.8)
White	501.4 (447.7, 555.2)	432.9 (385.5, 480.4)	374.4 (332.9, 415.9)	323.1 (289.2, 356.9)	256.8 (229.9, 283.7)	212.3 (184.9, 239.8)	170.6 (146.8, 194.5)	129.0 (107.7, 150.3)	−17.4 (−18.8, −16.0)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

159. Cerebral arteriogram



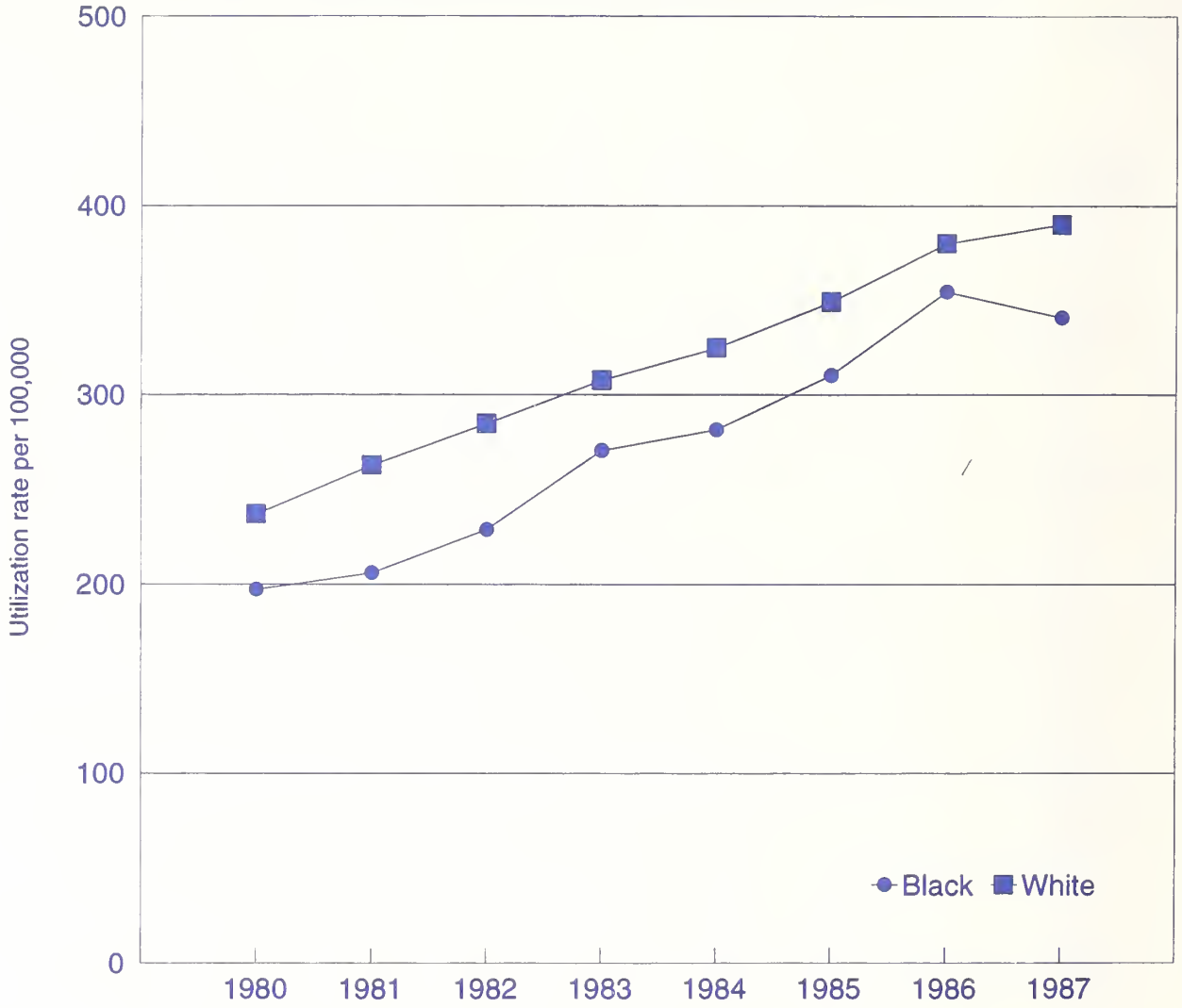
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	39.4 (28.4, 50.4)	45.7 (33.0, 58.4)	45.2 (32.8, 57.5)	56.7 (44.8, 68.6)	59.4 (47.0, 71.8)	61.2 (46.7, 75.8)	55.1 (38.3, 71.9)	44.3 (31.1, 57.5)	3.3 (–1.4, 8.2)
White	66.8 (57.3, 76.3)	70.5 (61.2, 79.8)	80.8 (70.2, 91.4)	91.0 (79.1, 102.9)	97.2 (84.9, 109.6)	92.6 (80.3, 104.9)	76.5 (65.8, 87.2)	67.9 (58.6, 77.2)	1.2 (–3.5, 6.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

160. Arteriogram and venogram (not heart or head)



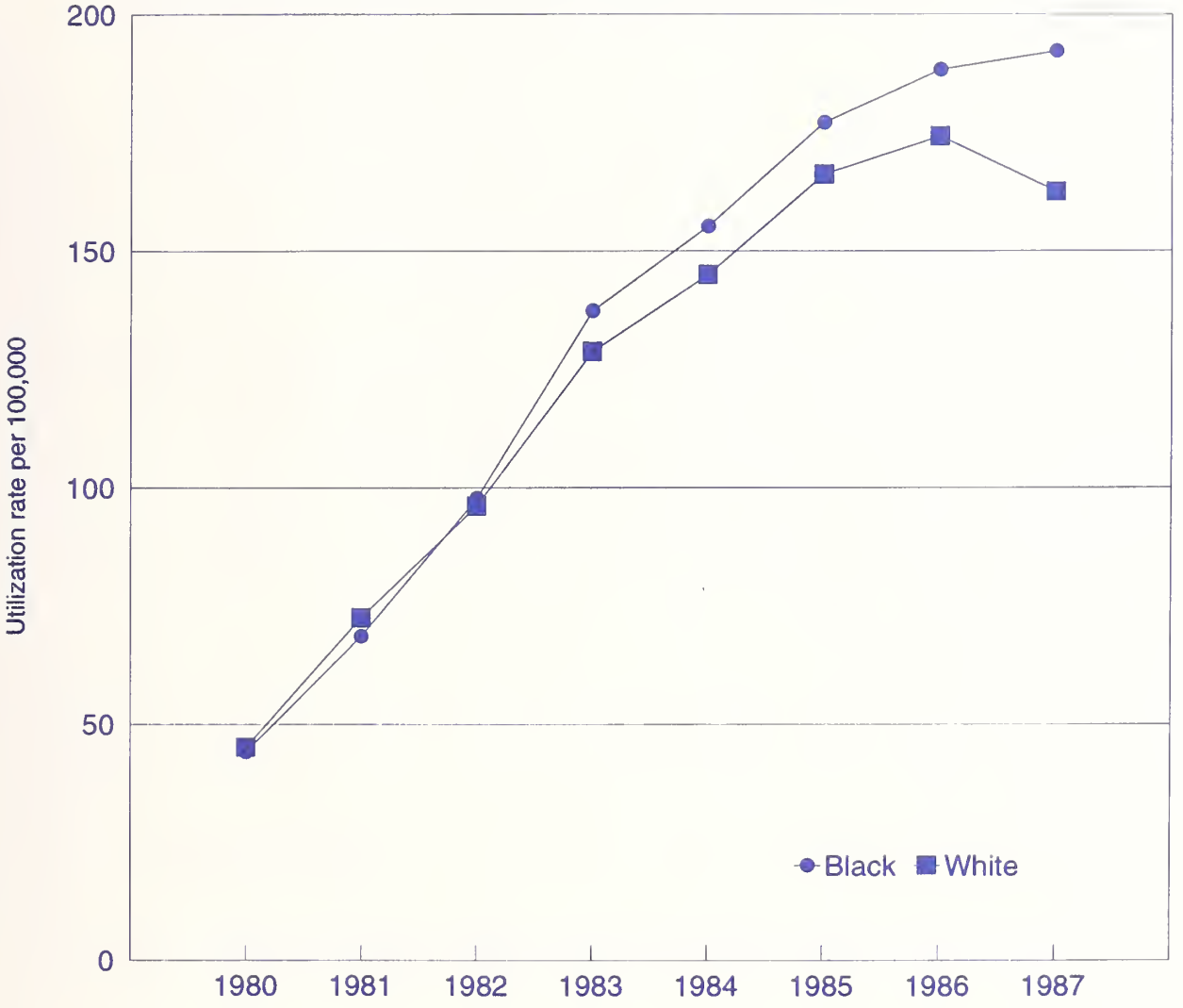
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	197.1 (151.8, 242.3)	206.0 (162.6, 249.5)	228.8 (165.6, 292.1)	270.3 (205.5, 335.1)	281.2 (209.8, 352.6)	310.2 (247.2, 373.2)	354.4 (266.2, 442.6)	340.7 (256.7, 424.7)	9.3 (7.8, 10.9)
White	236.8 (207.1, 266.5)	262.5 (226.3, 298.7)	284.5 (245.0, 324.0)	307.5 (267.4, 347.5)	324.6 (284.6, 364.6)	349.1 (302.4, 395.9)	380.0 (331.2, 428.7)	390.1 (332.7, 447.5)	7.4 (6.8, 8.1)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

161. Computerized axial tomography (CAT) scan, abdomen



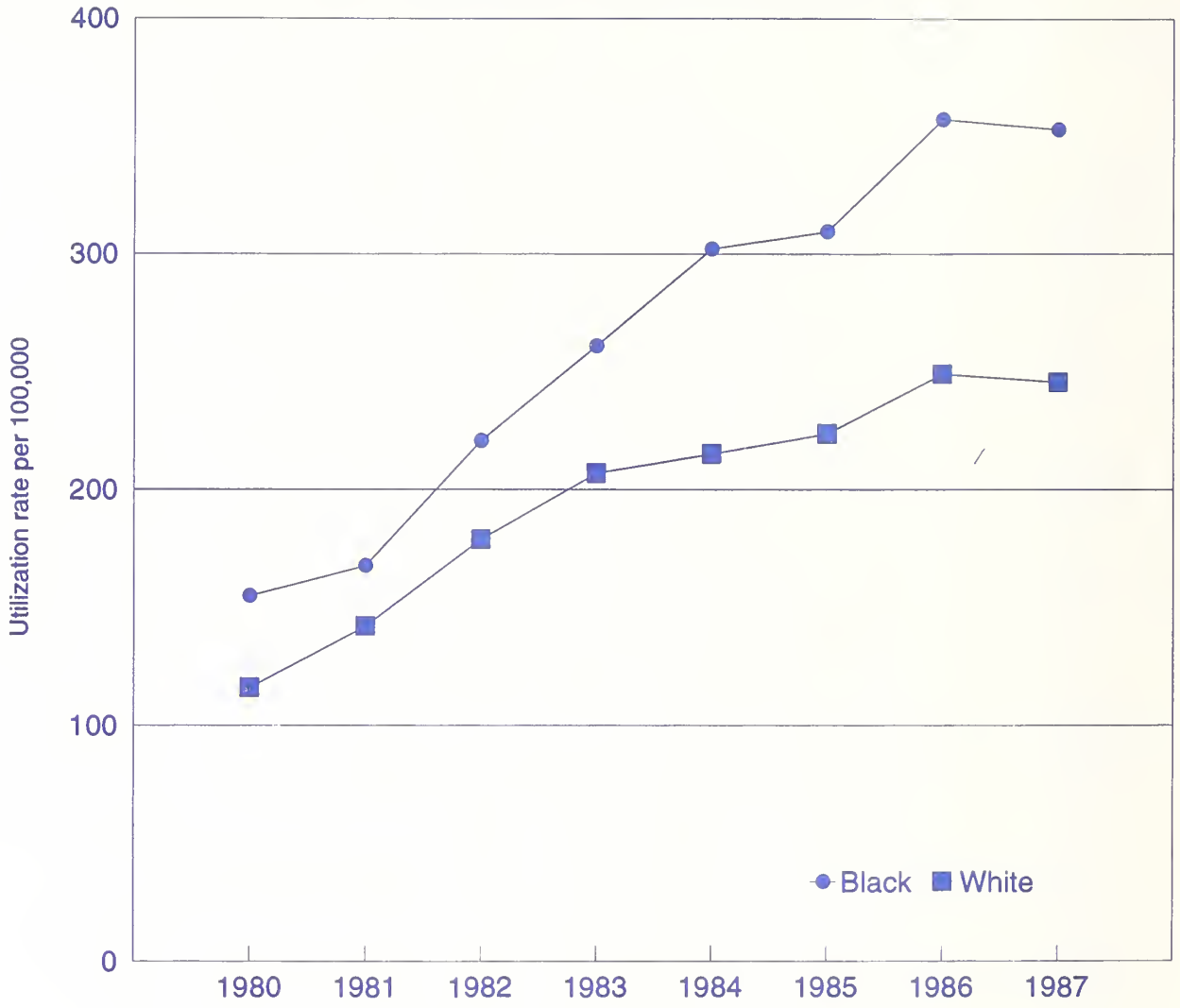
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	44.1 (29.5, 58.7)	68.5 (48.2, 88.7)	97.7 (74.0, 121.4)	137.4 (106.2, 168.5)	155.2 (118.2, 192.2)	177.0 (137.9, 216.0)	188.2 (139.9, 236.5)	192.1 (147.2, 237.0)	22.8 (15.5, 30.6)
White	45.1 (35.7, 54.5)	72.4 (59.4, 85.3)	96.1 (80.8, 111.4)	128.8 (112.2, 145.3)	145.0 (128.1, 161.8)	166.1 (144.8, 187.4)	174.1 (151.7, 196.4)	162.4 (137.5, 187.4)	19.7 (12.5, 27.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

162. Diagnostic ultrasound of heart



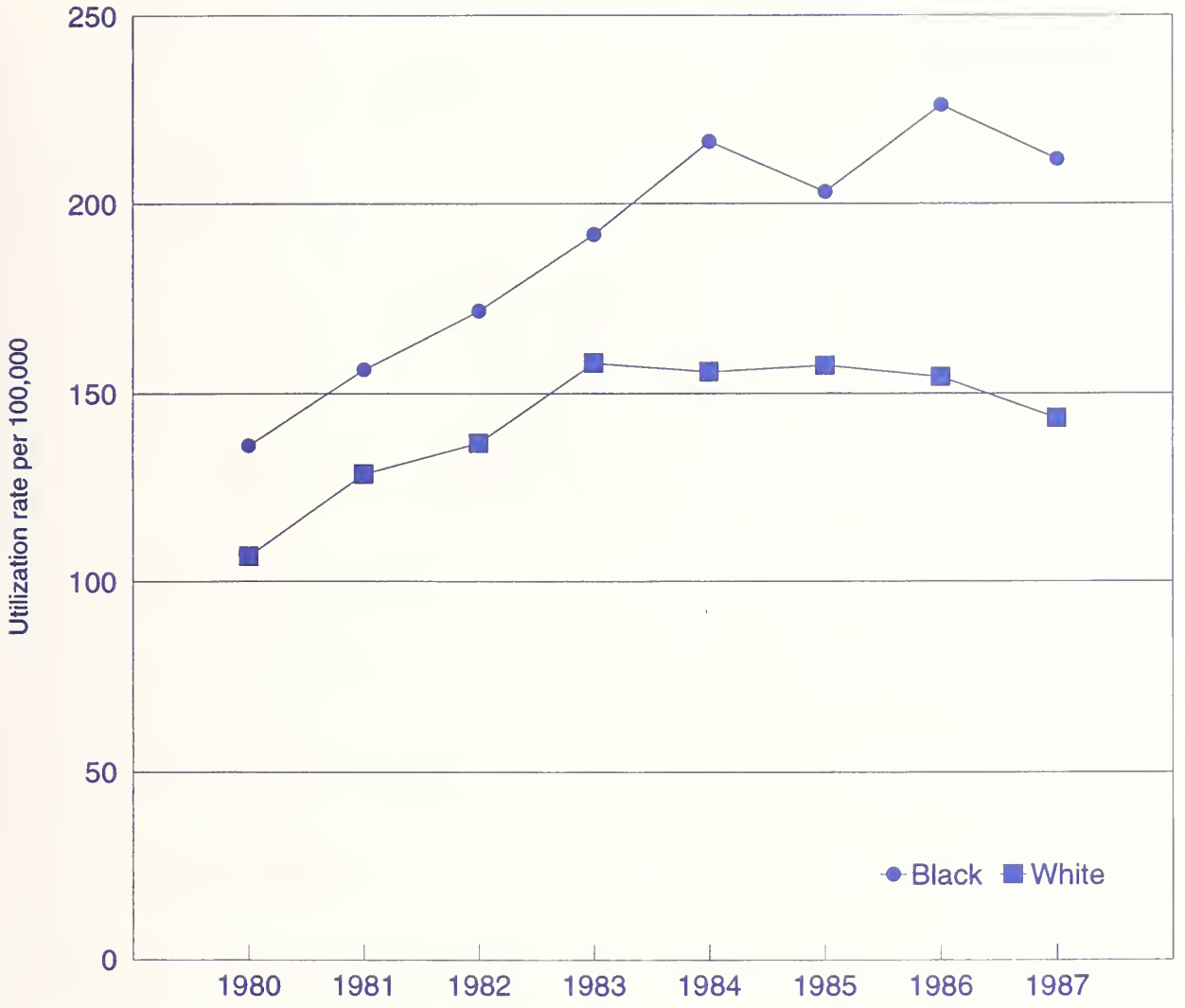
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	154.8 (94.7, 214.9)	167.6 (121.0, 214.1)	220.6 (172.5, 268.6)	260.8 (207.0, 314.6)	302.1 (220.8, 383.4)	309.5 (231.7, 387.3)	357.4 (254.7, 460.1)	353.1 (245.0, 461.3)	13.6 (10.6, 16.8)
White	115.9 (93.7, 138.1)	142.0 (117.3, 166.6)	178.8 (150.2, 207.3)	206.8 (175.4, 238.2)	215.0 (185.2, 244.8)	223.5 (190.7, 256.3)	248.7 (209.2, 288.2)	245.3 (191.1, 299.5)	11.0 (7.6, 14.5)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

163. Diagnostic ultrasound of abdomen



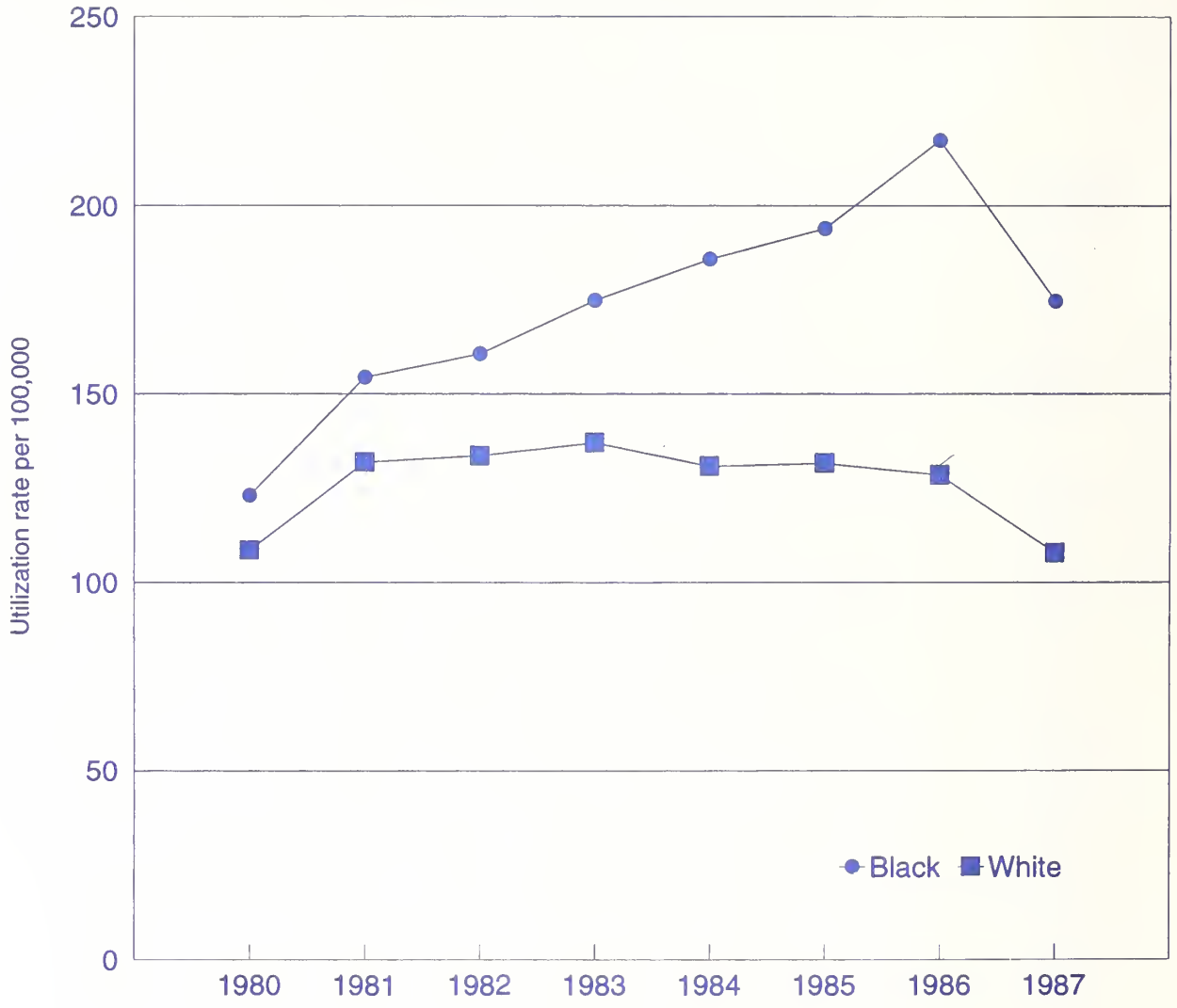
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	136.1 (100.8, 171.5)	156.3 (120.6, 192.0)	171.8 (130.3, 213.3)	191.8 (147.1, 236.5)	216.4 (162.5, 270.3)	203.1 (155.8, 250.5)	226.1 (166.5, 285.7)	211.7 (150.3, 273.0)	6.8 (4.4, 9.4)
White	106.6 (88.8, 124.4)	128.5 (109.1, 147.8)	136.8 (116.0, 157.6)	158.0 (128.5, 187.6)	155.7 (127.1, 184.2)	157.4 (128.2, 186.5)	154.4 (125.5, 183.3)	143.4 (107.7, 179.0)	4.1 (1.0, 7.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

164. Electroencephalogram (EEG)



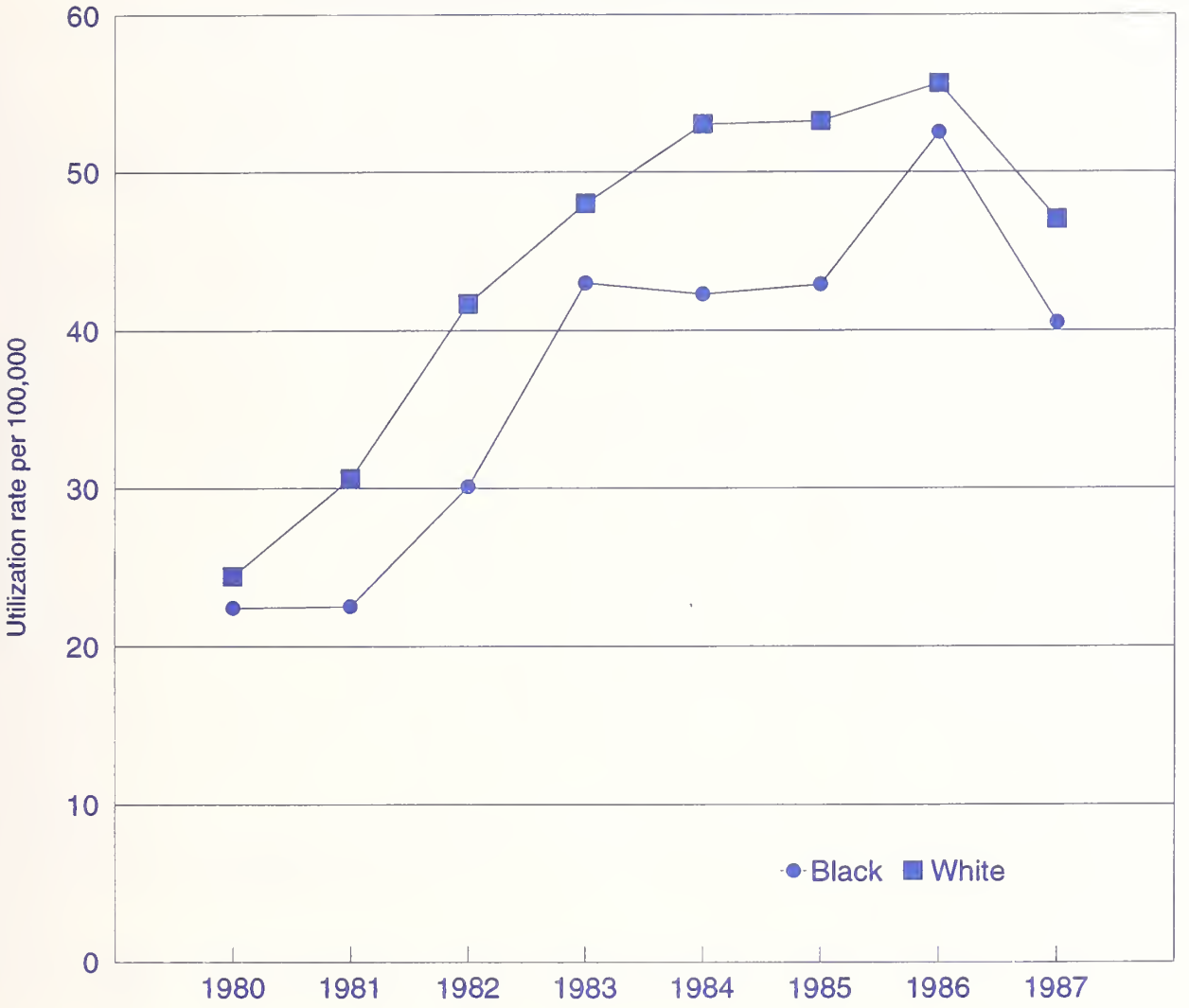
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	123.1 (91.1, 155.1)	154.3 (117.5, 191.1)	160.5 (119.4, 201.5)	174.7 (130.2, 219.1)	185.7 (133.5, 238.0)	193.9 (142.1, 245.7)	217.3 (139.6, 295.0)	174.5 (112.2, 236.8)	5.9 (2.5, 9.3)
White	108.6 (86.5, 130.7)	131.9 (108.1, 155.7)	133.6 (110.1, 157.1)	137.0 (114.1, 159.8)	130.8 (108.1, 153.4)	131.6 (110.7, 152.5)	128.5 (106.5, 150.5)	107.9 (86.0, 129.8)	–0.3 (–3.3, 2.8)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

165. Treadmill cardiac stress test



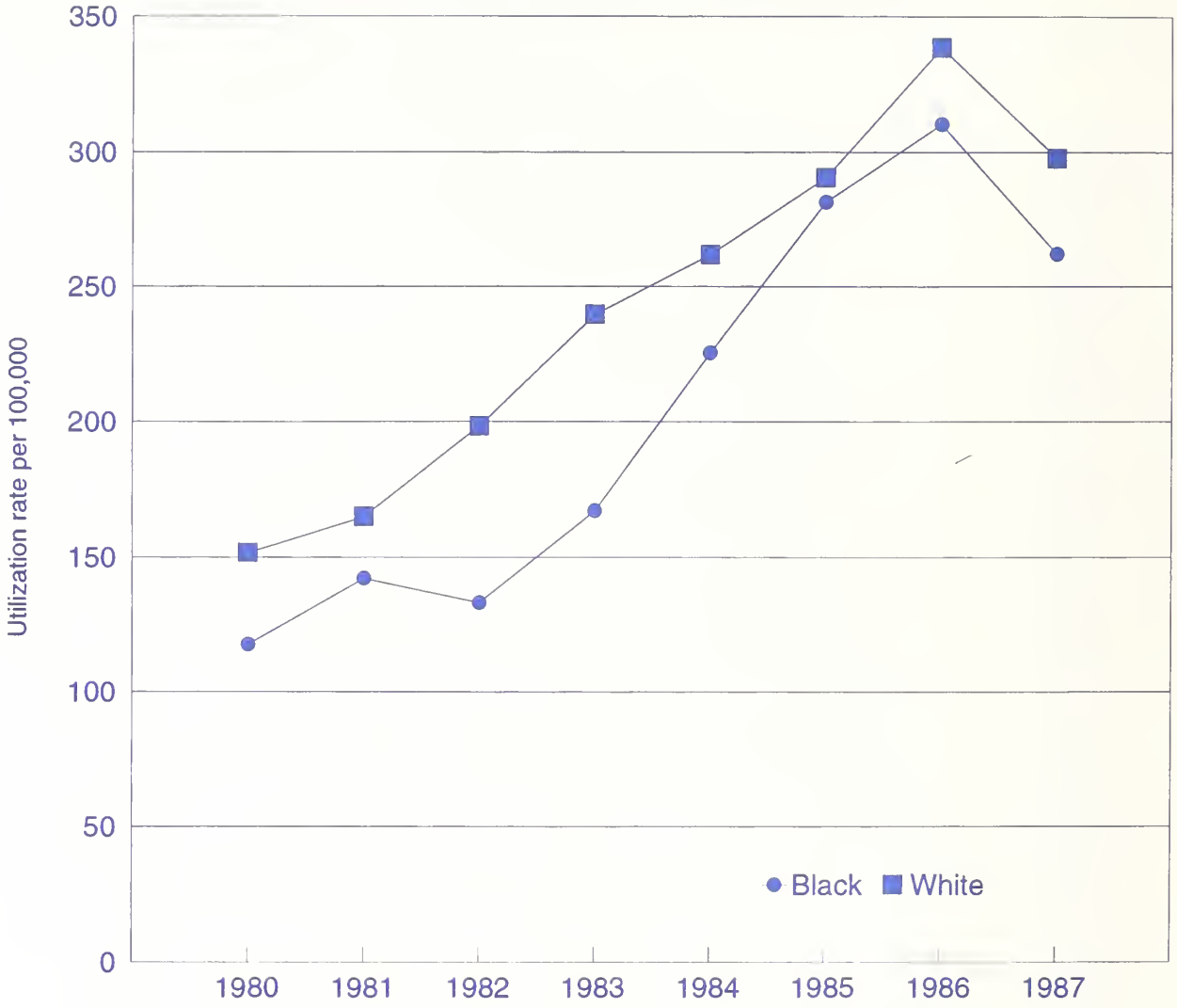
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	22.4 (13.0, 31.8)	22.5 (12.6, 32.4)	30.1 (19.2, 41.0)	43.0 (26.6, 59.5)	42.3 (30.8, 53.9)	42.9 (29.5, 56.4)	52.5 (36.1, 68.8)	40.5 (26.1, 54.8)	11.9 (6.0, 18.1)
White	24.4 (18.4, 30.3)	30.6 (23.4, 37.8)	41.7 (32.9, 50.5)	48.0 (38.1, 57.8)	53.0 (42.4, 63.6)	53.2 (41.9, 64.5)	55.6 (43.5, 67.8)	47.0 (34.7, 59.3)	10.5 (4.7, 16.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

166. Electrographic cardiac monitoring



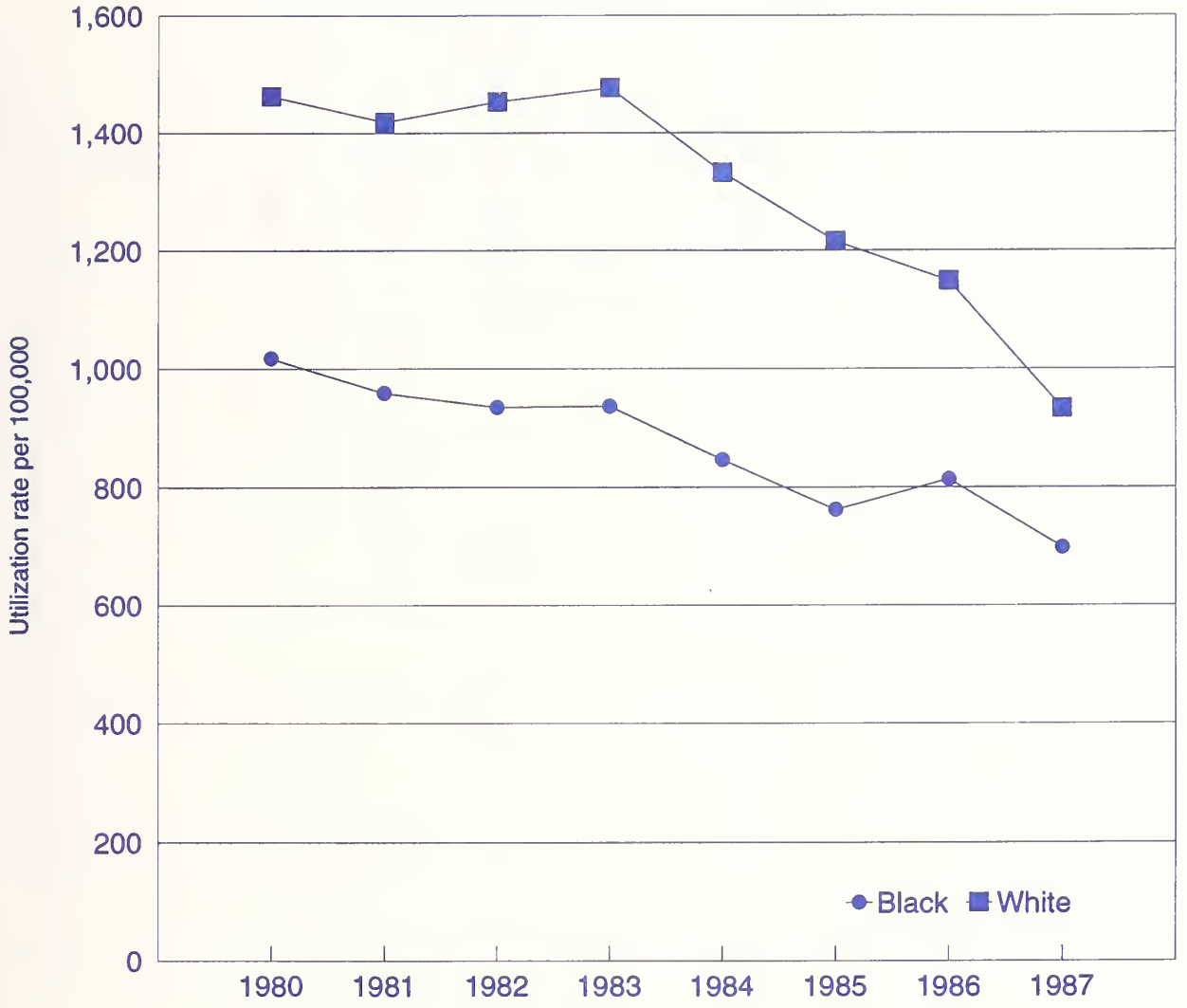
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	117.7 (56.7, 178.8)	142.2 (74.5, 210.0)	133.2 (82.6, 183.7)	167.0 (112.1, 221.9)	225.3 (161.7, 288.9)	281.4 (196.0, 366.8)	310.3 (210.5, 410.2)	262.0 (175.3, 348.6)	15.4 (10.6, 20.4)
White	151.6 (101.0, 202.2)	164.9 (117.7, 212.1)	198.3 (144.4, 252.1)	239.6 (183.3, 295.9)	261.8 (202.9, 320.7)	290.5 (226.9, 354.2)	338.5 (261.6, 415.4)	297.6 (192.3, 403.0)	12.0 (9.0, 15.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

167. Special treatments and rehabilitation



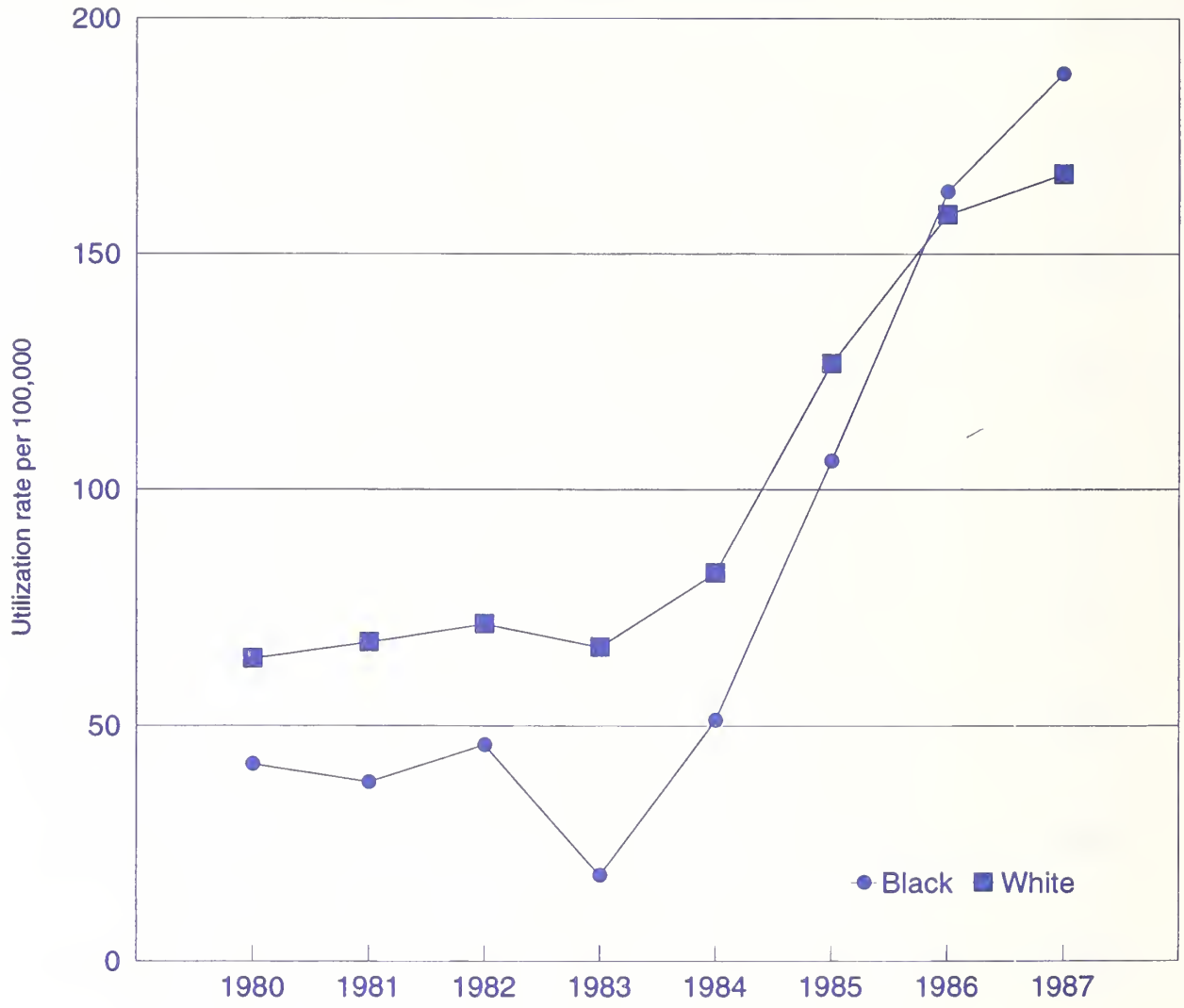
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	1,017.4	958.6	934.6	936.4	846.1	761.4	813.2	697.8	–4.9
	(817.7,	(770.4,	(749.5,	(729.5,	(675.4,	(576.0,	(590.4,	(497.9,	(–6.1,
	1,217.0)	1,146.7)	1,119.7)	1,143.3)	1,016.8)	946.7)	1,036.0)	897.7)	–3.6)
White	1,462.4	1,418.3	1,453.2	1,476.5	1,332.1	1,215.2	1,148.4	932.8	–5.6
	(1,262.8,	(1,233.5,	(1,262.4,	(1,283.7,	(1,140.4,	(1,011.9,	(945.3,	(749.2,	(–7.9,
	1,662.1)	1,603.2)	1,644.0)	1,669.3)	1,523.8)	1,418.6)	1,351.5)	1,116.4)	–3.2)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

168. Psychiatric procedures



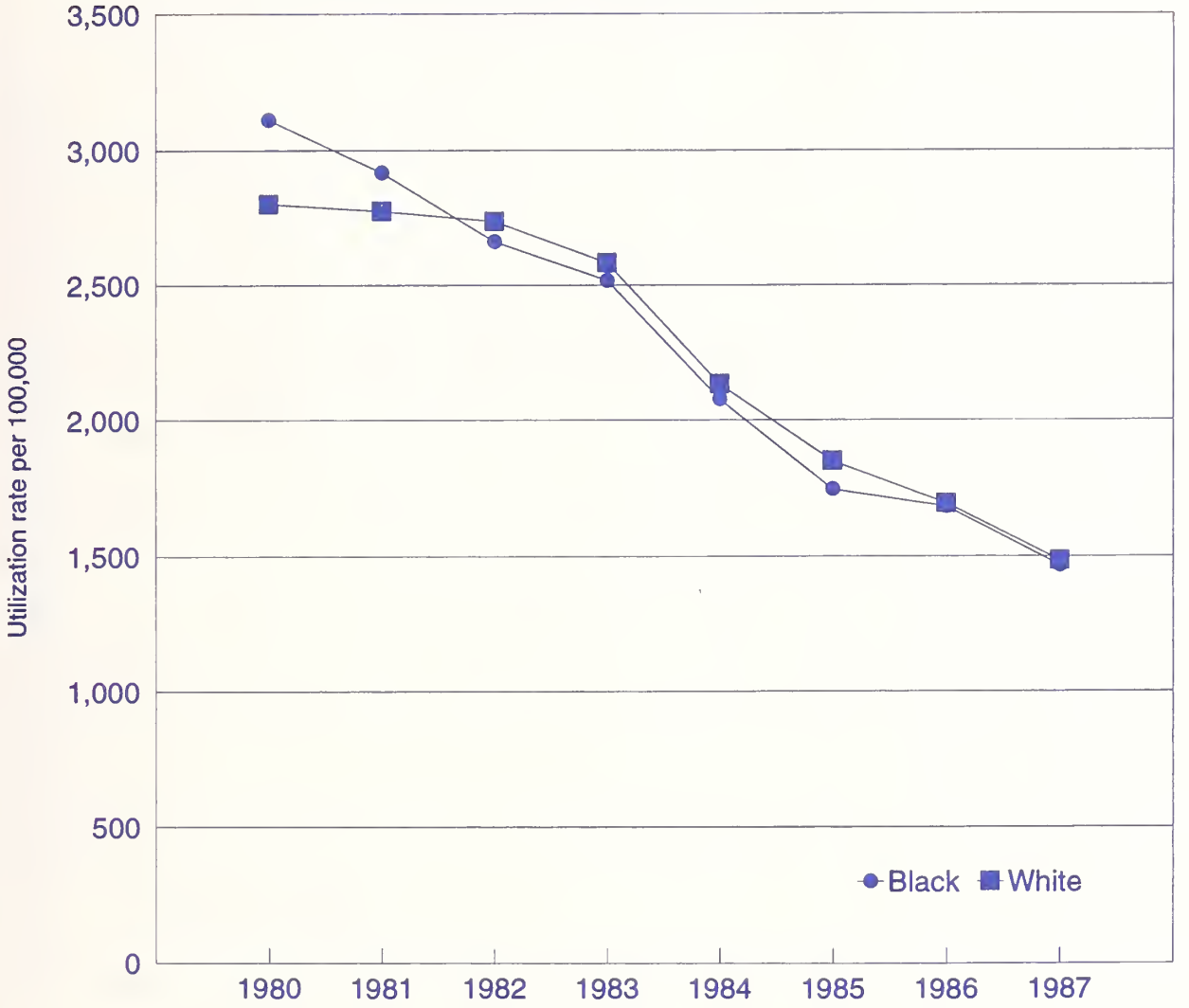
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	41.9 (6.7, 77.1)	38.1 (6.7, 69.5)	46.0 (3.8, 88.1)	18.2 (11.0, 25.3)	51.2 (36.3, 66.1)	106.1 (58.9, 153.4)	163.2 (91.4, 235.0)	188.2 (101.1, 275.2)	28.9 (9.4, 51.9)
White	64.1 (40.0, 88.3)	67.5 (40.8, 94.2)	71.4 (41.9, 101.0)	66.5 (43.3, 89.7)	82.2 (56.1, 108.3)	126.8 (91.4, 162.1)	158.3 (117.3, 199.4)	166.9 (123.7, 210.1)	16.6 (10.8, 22.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

169. Other x-ray and diagnostic procedures



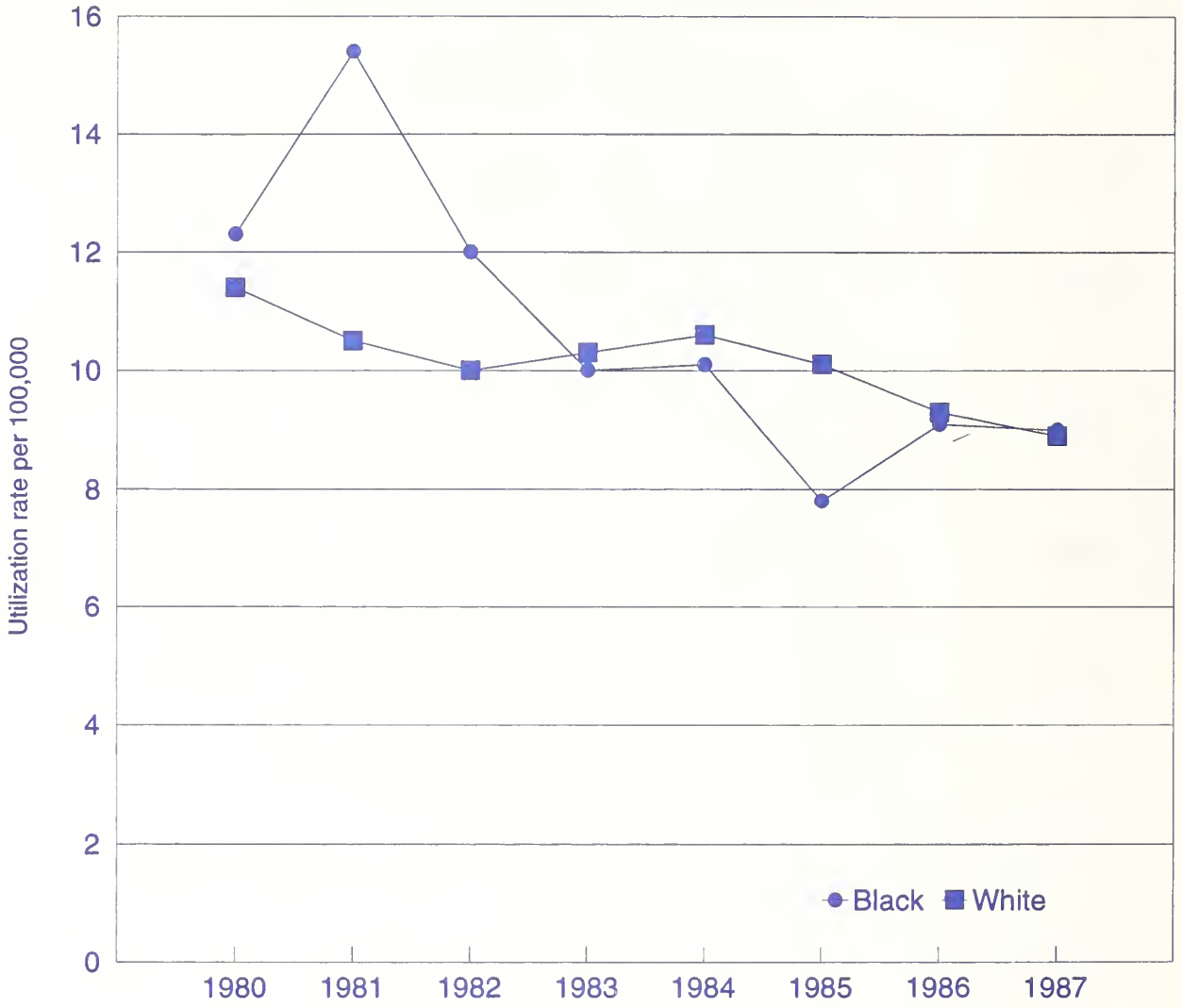
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	3,110.8 (2,390.3, 3,831.2)	2,917.6 (2,283.5, 3,551.7)	2,661.9 (2,090.2, 3,233.6)	2,517.3 (2,049.4, 2,985.1)	2,076.6 (1,708.7, 2,444.6)	1,745.9 (1,413.1, 2,078.7)	1,682.4 (1,313.9, 2,050.8)	1,465.8 (1,127.6, 1,804.0)	–10.7 (–11.9, –9.4)
White	2,801.0 (2,478.6, 3,123.3)	2,774.3 (2,451.3, 3,097.3)	2,737.2 (2,420.4, 3,053.9)	2,582.5 (2,269.8, 2,895.1)	2,132.3 (1,904.9, 2,359.7)	1,849.4 (1,633.8, 2,065.0)	1,693.8 (1,487.2, 1,900.4)	1,484.6 (1,269.4, 1,699.8)	–9.4 (–11.4, –7.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

170. Other removal of foreign body



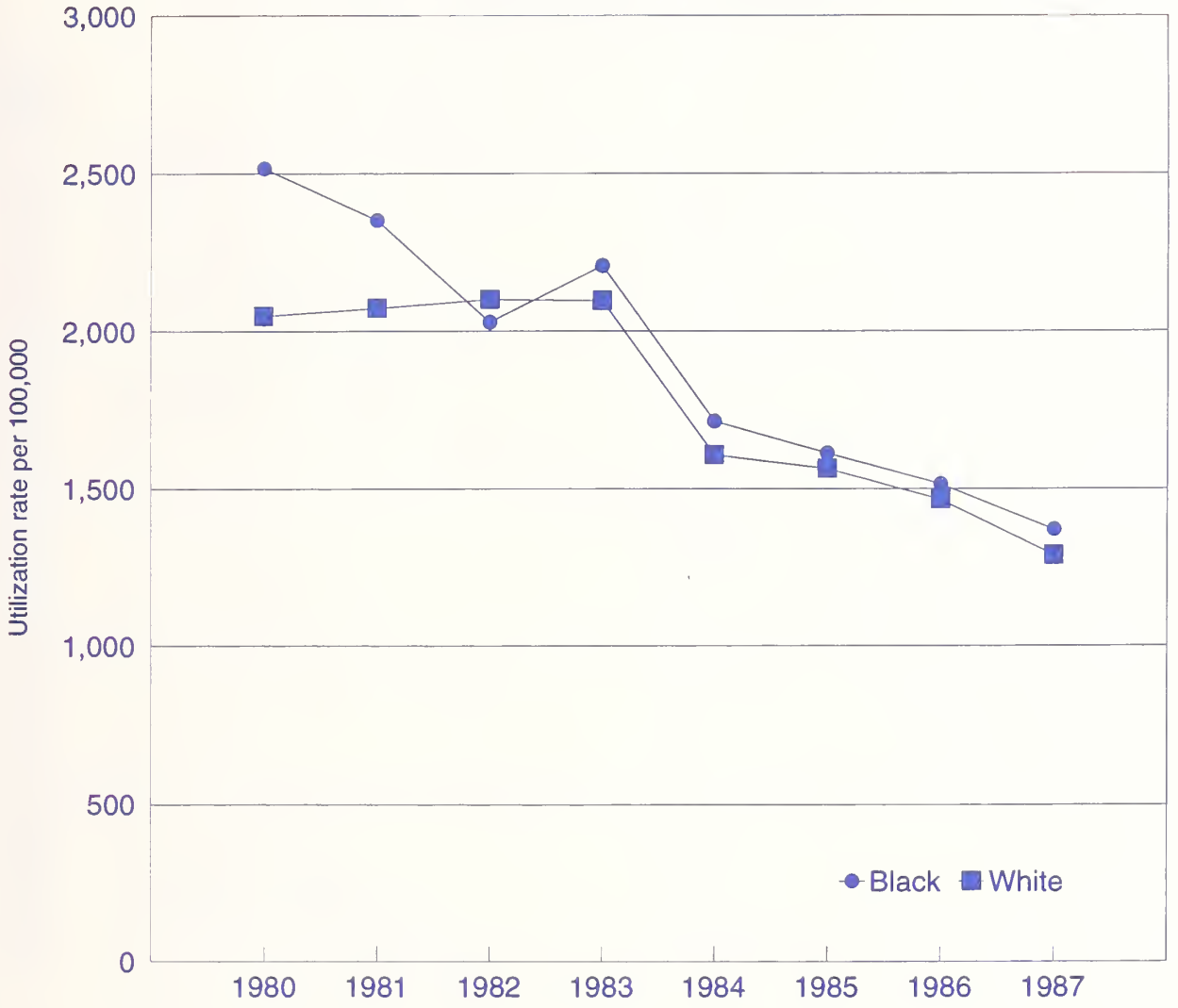
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	12.3	15.4	12.0	10.0	10.1	7.8	9.1	9.0	–7.0
	(8.8,	(11.1,	(8.9,	(6.8,	(7.5,	(5.4,	(5.7,	(5.9,	(–10.7,
	15.7)	19.7)	15.1)	13.1)	12.6)	10.2)	12.4)	12.2)	–3.1)
White	11.4	10.5	10.0	10.3	10.6	10.1	9.3	8.9	–2.7
	(10.1,	(9.2,	(8.8,	(9.1,	(9.3,	(8.9,	(8.0,	(7.6,	(–4.0,
	12.8)	11.8)	11.3)	11.5)	12.0)	11.3)	10.6)	10.2)	–1.4)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

171. Miscellaneous procedures



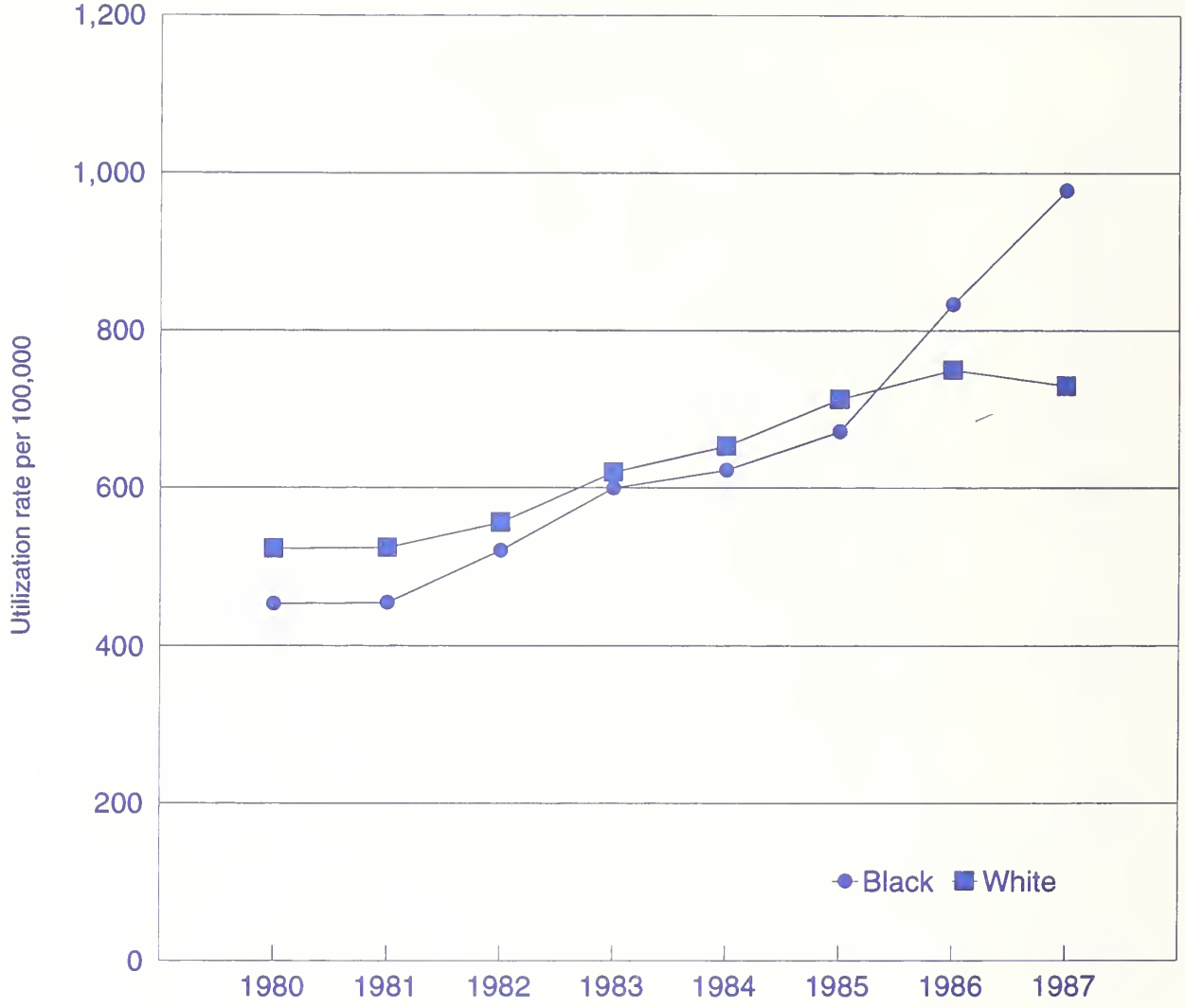
Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	2,515.5	2,351.2	2,027.7	2,208.1	1,714.4	1,612.8	1,514.6	1,368.8	–8.4
	(1,815.5,	(1,680.2,	(1,448.0,	(1,548.1,	(1,230.6,	(1,119.6,	(1,015.0,	(958.5,	(–10.0,
	3,215.5)	3,022.2)	2,607.4)	2,868.2)	2,198.3)	2,106.0)	2,014.2)	1,779.1)	–6.8)
White	2,048.0	2,072.4	2,100.6	2,095.9	1,607.8	1,563.0	1,464.8	1,287.3	–7.0
	(1,676.9,	(1,694.6,	(1,730.1,	(1,651.4,	(1,352.3,	(1,293.1,	(1,191.1,	(1,024.9,	(–9.3,
	2,419.1)	2,450.3)	2,471.1)	2,540.4)	1,863.3)	1,832.8)	1,738.5)	1,549.6)	–4.7)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

172. Other nonoperative treatment



Utilization rate per 100,000, estimated annual percent change (EAPC), and confidence interval in parentheses

Race	1980	1981	1982	1983	1984	1985	1986	1987	EAPC
Black	452.8 (318.0, 587.5)	454.0 (336.1, 571.9)	519.6 (389.4, 649.8)	599.1 (453.5, 744.7)	622.1 (501.8, 742.3)	671.3 (535.3, 807.3)	833.2 (595.8, 1,070.6)	977.7 (648.5, 1,306.9)	11.6 (9.6, 13.7)
White	522.3 (451.1, 593.5)	523.5 (446.0, 600.9)	555.2 (481.4, 629.1)	619.3 (517.8, 720.8)	652.8 (576.4, 729.2)	712.6 (608.5, 816.6)	749.8 (646.5, 853.2)	729.5 (623.2, 835.7)	6.1 (4.8, 7.3)

Note: Based on 20 percent of discharges from the Hospital Cost and Utilization Project, 1980-87, weighted to obtain national estimates, and age- and sex-adjusted to the 1970 resident U.S. population.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

Appendix A
Procedure categories and ICD-9-CM codes

Category number	Procedure category	ICD-9-CM codes[1]
	Operations on the Nervous System	
1.	Incision and excision of central nervous system	01.0, 01.2-01.6
2.	Extracranial ventricular shunt	02.3-02.4
3.	Laminectomy, excision intervertebral disc	03.0, 80.5, 81.0
4.	Spinal tap, injection into spinal canal	03.31, 03.91-03.92
5.	Decompression peripheral nerve	04.43-04.49
6.	Other nervous system procedures	01.1, 02.0-02.2, 02.9, 03.1-03.2, 03.32-03.8, 03.90, 03.93-03.99, 04.0, 04.1, 04.2-04.42, 04.5-04.9, 05.0-05.9
	Operations on the Endocrine System	
7.	Thyroidectomy	06.2-06.6
8.	Other endocrine procedures	06.0-06.1, 06.7-07.9
	Operations on the Eye	
9.	Corneal transplant	11.6
10.	Glaucoma procedures	12.5-12.7
11.	Lens (cataract) extraction	13.1-13.9
12.	Repair of retinal tear, detachment	14.3-14.5
13.	Other retina procedures	14.2
14.	Other eye procedures	08.0-11.5, 11.7-12.4, 12.8-13.0, 14.0-14.1, 14.6-16.9
	Operations on the Ear	
15.	Myringotomy, tympanostomy, tympanoplasty	19.4-19.6, 20.0
16.	Other ear procedures	18.0-19.3, 19.7-19.9, 20.1-20.3, 20.5-20.9
17.	Mastoidectomy	20.4
	Operations on the Nose, Mouth, and Pharynx	
18.	Control of epistaxis	21.0
19.	Plastic procedures on nose	21.5, 21.8
20.	Tooth procedures	23.0-23.4
21.	Procedures on the mouth and palate	27.5-27.6
22.	Tonsillectomy and/or adenoidectomy	28.2-28.3, 28.6
23.	Other procedures on nose, fracture repair	21.1, 21.3-21.4, 21.6-21.7
24.	Other procedures on the nasopharynx	21.2, 21.9-22.9, 23.5-27.4, 27.7-28.1, 28.4-28.5, 28.7-29.9
	Operations on the Respiratory System	
25.	Excision lesion of larynx	30.0
26.	Tracheostomy, temporary and permanent	31.1-31.2
27.	Tracheoscopy, laryngoscopy (including biopsy)	31.41-31.44
28.	Lobectomy or pneumonectomy	32.3-32.5
29.	Bronchoscopy and biopsy of bronchus	33.21-33.24
30.	Thoracotomy, chest drainage	34.0
31.	Thoracentesis	34.91
32.	Other respiratory diagnostic procedures	31.45-31.49, 33.25-33.29, 34.2
33.	Other procedures on respiratory system	30.1-31.09, 31.3, 31.5-32.29, 32.6-33.19, 33.3-33.99, 34.1, 34.3-34.89, 34.92-34.99
	Operations on the Cardiovascular System	
34.	Heart valve procedures	35.1-35.2, 35.96, 35.99
35.	Coronary artery bypass graft (CABG)	36.1-36.2
36.	Percutaneous transluminal coronary angioplasty (PTCA)	36.00-36.02, 36.05
37.	Cardiac catheterization, coronary arteriography	37.21-37.23, 88.55-88.57
38.	Heart transplant	37.5
39.	Insertion of cardiac pacemaker	37.7-37.8
40.	Endarterectomy (any vessel)	38.1

See note at end of table. Source: AHCPR, Division of Provider Studies.

Appendix A—Continued
Procedure categories and ICD-9-CM codes

Category number	Procedure category	ICD-9-CM codes[1]
	Operations on the Cardiovascular System—con.	
41.	Aortic resection with replacement	38.44
42.	Varicose vein stripping	38.5
43.	Other vascular catheterization, not heart	38.91-38.93
44.	Peripheral vascular bypass	39.25, 39.29
45.	Other vascular bypass and shunt, not heart	39.0-39.24, 39.26, 39.28
46.	Creation of arteriovenous fistula	39.27
47.	Hemodialysis	39.95
48.	Other cardiovascular procedures	35.0, 35.52, 36.04, 36.09, 36.3, 37.0, 37.12, 37.24-37.31, 37.4, 37.6, 37.9-38.09, 38.2-38.43, 38.45-38.49, 38.6-38.90, 38.94-38.99, 39.3-39.94, 39.96-39.99
49.	Other open heart procedures	35.3-35.51, 35.53-35.95, 35.98, 36.03, 36.9, 37.1-37.11, 37.32-37.33
	Operations on the Hemic and Lymphatic System	
50.	Bone marrow transplant	41.0
51.	Bone marrow biopsy	41.31
52.	Splenectomy	41.5
53.	Other procedures, hemic and lymphatic system	40.0-40.9, 41.1-41.2, 41.32-41.49, 41.9
	Operations on the Digestive System	
54.	Injection or ligation of esophageal varices	42.91
55.	Esophageal dilation	42.92
56.	Upper gastrointestinal endoscopy, biopsy	42.23-42.24, 44.13-44.15, 45.13-45.15
57.	Gastrostomy, temporary and permanent	43.1-43.2
58.	Colostomy, temporary and permanent	46.1
59.	Ileostomy and other enterostomy	46.2-46.3
60.	Surgical treatment for peptic ulcer	43.6-43.7, 44.0, 44.2, 44.4-44.5
61.	Colonoscopy and biopsy	45.23-45.26
62.	Colon resection	45.7-45.8, 48.4-48.6
63.	Small bowel resection	45.6
64.	Appendectomy	47.0
65.	Proctoscopy and biopsy	48.23-48.25, 49.21
66.	Hemorrhoid procedures	49.4
67.	Cholecystectomy and common duct exploration	51.2, 51.4-51.5
68.	Other gallbladder procedures	51.0-51.1, 51.3, 51.6-51.99
69.	Endoscopic cannulation of pancreas (ERCP)	52.91
70.	Inguinal and femoral hernia repair	53.0-53.3
71.	Other hernia repair	53.4-53.9
72.	Incision of abdominal wall	54.0, 54.3-54.4, 54.91
73.	Exploratory laparotomy	54.11
74.	Other laparotomy	54.12-54.19
75.	Laparoscopy	54.21
76.	Excision, lysis peritoneal tissue	54.5
77.	Peritoneal dialysis	54.98
78.	Other upper gastrointestinal procedures	43.3-43.5, 43.8, 44.3, 44.6-44.9, 45.3-45.4
79.	Other anal and rectal procedures	48.3, 49.1, 49.3, 48.8
80.	Other gastrointestinal biopsy, endoscopy	42.21-42.24, 44.11-44.12, 45.10-45.12, 45.16-45.22, 45.27-45.29, 48.20-48.22, 48.26-48.29, 49.20, 49.22-49.29, 52.1

See note at end of table. Source: AHCPR, Division of Provider Studies.

Appendix A—Continued
Procedure categories and ICD-9-CM codes

Category number	Procedure category	ICD-9-CM codes[1]
	Operations on the Digestive System—con.	
81.	Other gastrointestinal procedures	45.00-45.03, 45.9, 46.4-46.9, 42.0-42.19, 42.29-42.90, 42.93-43.09, 43.9, 44.16-44.19, 45.5, 46.0, 47.1-48.1, 48.7, 48.9-49.09, 49.50-50.99, 52.0, 52.2-52.83, 52.92-52.99, 54.22-54.29, 54.6-54.79, 54.90, 54.92-54.97, 54.99
	Operations on the Urinary System	
82.	Endoscopy of the urinary tract	55.21-55.22, 56.31, 57.32, 58.22-58.23
83.	Surgical removal of urinary calculus	55.01, 55.03-55.04, 55.11
84.	Nephrectomy	55.5
85.	Kidney transplant	55.6
86.	Transurethral removal of urinary obstruction	56.0
87.	Ureterotomy	56.2
88.	Transurethral biopsy, bladder tissue	57.33, 57.4
89.	Genitourinary incontinence procedures	59.3-59.7, 70.5
90.	Ureteral catheterization	59.8
91.	Extracorporeal lithotripsy, urinary	59.96
92.	Other nephrotomy	55.02, 55.05-55.10, 55.12-55.19
93.	Procedures on the urethra	58.1, 58.4, 58.6
94.	Biopsy of urinary tract	55.23-55.24, 56.32-56.33, 57.31, 57.34, 58.21, 58.24, 59.2
95.	Other procedures on the urinary tract	57.94-57.95, 57.8, 55.29-55.49, 55.7-55.9, 56.1, 56.39-57.30, 57.39, 57.5-57.7, 57.90-57.93, 57.96-58.09, 58.29-58.31, 58.34-58.39, 58.9-59.19, 59.90-59.95, 59.97-59.99
	Operations on the Male Genital Organs	
96.	Transurethral prostatectomy (TURP)	60.2
97.	Open prostatectomy	60.3-60.6
98.	Orchiectomy, orchiopexy	61.2, 61.92, 62.3-62.5
99.	Circumcision	64.0
100.	Diagnostic procedures, male genital	60.1, 61.1, 62.1, 63.0, 64.1
101.	Other procedures, male genital	60.0, 60.7-61.09, 61.3-61.91, 61.99-62.09, 62.2, 62.6-62.9, 63.1-63.6, 63.8-63.9, 64.2-64.9, 63.7
	Operations on the Female Genital Organs	
102.	Oophorectomy, unilateral and bilateral	65.3-65.6
103.	Other operations on ovary	65.0, 65.2, 65.7-65.9
104.	Ligation of fallopian tubes	66.2-66.3
105.	Salpingectomy, removal tubal pregnancy	66.62
106.	Other operations on fallopian tubes	66.4-66.61, 66.63-66.9
107.	Hysterectomy, abdominal and vaginal	68.3-68.7
108.	Abortion (termination of pregnancy)	69.01, 69.51, 74.91, 75.0, 96.49
109.	Dilation and curettage (D&C), aspiration after delivery or abortion	69.02, 69.52
110.	Diagnostic dilation and curettage (D&C)	69.09
111.	Other excision of cervix and uterus	67.2-67.4, 68.2, 69.1
112.	Other diagnostic procedures, female organs	65.1, 66.1, 67.1, 68.1, 70.2, 71.1
113.	Other procedures, female organs	66.0, 67.0, 67.5-68.09, 68.8, 69.2-69.4, 69.53-70.19, 70.3-70.4, 70.6-70.9, 71.0, 71.2-71.9
	Obstetrical Procedures	
114.	Episiotomy	73.6
115.	Procedures to assist delivery	72.0-73.5, 73.8-73.9, 75.4-75.6
116.	Cesarean section	74.0-74.2, 74.4, 74.90, 74.99

See note at end of table. Source: AHCPR, Division of Provider Studies.

Appendix A—Continued
Procedure categories and ICD-9-CM codes

Category number	Procedure category	ICD-9-CM codes[1]
	Obstetrical Procedures—con.	
117.	Amniocentesis	75.1
118.	Fetal monitoring	75.3
119.	Other obstetrical procedures	74.3, 75.2, 75.7-75.9
	Operations on the Musculoskeletal System	
120.	Partial excision of bone	76.2-76.3, 77.6-77.8
121.	Jaw fracture repair	76.71-76.77, 76.93-76.96
122.	Bunionectomy	77.5
123.	Treatment, fracture of radius and ulna	78.53, 78.63, 79.02, 79.12, 79.22, 79.32, 79.42, 79.52, 79.62, 79.72, 79.73, 79.82, 79.83, 79.92
124.	Treatment, fracture of hip and femur	78.55, 78.65, 79.05, 79.15, 79.25, 79.35, 79.45, 79.55, 79.65, 79.75, 79.85, 79.95
125.	Treatment, fracture of lower extremity	78.56-78.58, 78.66-78.68, 79.06-79.08, 79.16-79.18, 79.26-79.28, 79.36-79.38, 79.46-79.48, 79.56-79.58, 79.66-79.68, 79.76-79.78, 79.86-79.88, 79.96-79.98
126.	Incision of bone	76.0, 77.0-77.3
127.	Arthroscopy	80.2
128.	Division of joint capsule, cartilage	80.4
129.	Excision of semilunar cartilage of knee	80.6
130.	Arthroplasty of knee	81.41-81.47
131.	Hip replacement, total and partial	81.5-81.6
132.	Arthrocentesis	81.91
133.	Procedures on muscles and tendons	82.0-83.19, 83.3
134.	Amputation of lower extremity	84.1
135.	Other fracture and dislocation procedures	76.70, 76.78-76.92, 76.97-76.99, 78.50-78.52, 78.54, 78.60-78.62, 78.64, 78.69, 79.00-79.01, 79.03-79.04, 79.09, 79.10-79.11, 79.13-79.14, 79.20-79.21, 79.23-79.24, 79.30-79.31, 79.33-79.34, 79.40-79.41, 79.43-79.44, 79.50-79.51, 79.53-79.54, 79.60-79.61, 79.63-79.64, 79.70-79.71, 79.74, 79.79, 79.80-79.81, 79.84, 79.90-79.91, 79.93-79.94, 79.99
136.	Other local excision of lesion of joint	80.8
137.	Repair and plastic procedures on bone	78.0-78.4, 78.7, 78.9
138.	Arthroplasty of other joint	81.3, 81.48-81.49, 81.7-81.8
139.	Other procedures, musculoskeletal system	76.1, 76.4-76.6, 77.4, 77.9, 78.8, 80.0-80.19, 80.3, 80.7, 80.9, 81.1-81.2, 81.92-81.99, 83.2, 84.0, 84.2-84.9
	Operations on the Integumentary System	
140.	Breast biopsy	85.11-85.12
141.	Mastectomy, quadrantectomy, lumpectomy	85.20-85.23, 85.4
142.	Incision of skin and subcutaneous tissue	86.0
143.	Diagnostic procedure, skin and subcutaneous tissue	86.1
144.	Excision of pilonidal cyst	86.21
145.	Debridement of wound	86.22
146.	Excision of skin lesion	86.3
147.	Other excision of skin and subcutaneous tissue	86.23-86.29, 86.4
148.	Suture of skin and subcutaneous tissue	86.5
149.	Skin graft	86.6-86.7
150.	Other repair of skin and subcutaneous tissue	86.8
151.	Other procedures on skin and breast	85.0, 85.24-85.39, 85.5, 86.9

See note at end of table. Source: AHCPR, Division of Provider Studies.

Appendix A—Continued
Procedure categories and ICD-9-CM codes

Category number	Procedure category	ICD-9-CM codes[1]
	Miscellaneous Diagnostic and Therapeutic Procedures	
152.	Encephalogram	87.01-87.02
153.	Computerized axial tomography (CAT) scan, head	87.03
154.	Myelogram	87.21
155.	Routine chest x-ray	87.44
156.	Upper gastrointestinal x-ray	87.61-87.62
157.	Lower gastrointestinal x-ray	87.64
158.	Intravenous pyelogram	87.73
159.	Cerebral arteriogram	88.41
160.	Arteriogram and venogram (not heart or head)	88.40, 88.42-88.54, 88.58, 88.6
161.	Computerized axial tomography (CAT) scan, abdomen	88.01
162.	Diagnostic ultrasound of heart	88.72
163.	Diagnostic ultrasound of abdomen	88.76
164.	Electroencephalogram (EEG)	89.14
165.	Treadmill cardiac stress test	89.41
166.	Electrographic cardiac monitoring	89.54
167.	Special treatments and rehabilitation	93.0-93.9
168.	Psychiatric procedures	94.0-94.5
169.	Other x-ray and diagnostic procedures	85.19, 87.04-87.17, 87.22-87.43, 87.45-87.59, 87.63, 87.65-87.72, 87.74-87.9, 88.00, 88.02-88.39, 88.71, 88.73-88.75, 88.77-88.79, 88.81, 88.82, 88.9, 92.0-92.19
170.	Other removal of foreign body	98.0-98.2
171.	Miscellaneous procedures	89.0-89.13, 89.15-89.40, 89.42-89.53, 89.55-91.99, 95.0-96.48, 96.51-97.89
172.	Other nonoperative treatment	92.21-92.29, 99.0-99.99

[1] Codes reflect valid ICD-9-CM codes as of October 1987.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

Appendix B
Development of discharge weights for the Hospital Cost and Utilization Project, 1980-87

Introduction

To compute national estimates of hospital discharges using data from the Hospital Cost and Utilization Project, 1980-87 (HCUP-2), the number of discharges from each HCUP-2 hospital must be multiplied by an appropriate weight that reflects the proportion of the universe represented by the hospital. This appendix summarizes the approach used to develop discharge weights, including the computation of weights, adjustment for reporting gaps, and investigation of and correction for individual hospital and stratum anomalies.

The HCUP-2 sample of hospitals was drawn from the universe of short-term, general, non-Federal hospitals in the United States with 30 or more beds. The sample was stratified along several hospital characteristics that are thought to distinguish hospital behavior. Table B-1 summarizes these characteristics and their dimensions. (For specific statistics comparing HCUP-2 with the American Hospital Association [AHA] universe of hospitals, see Coffey and Farley [1988].) The identities of the individual hospitals were unknown to the authors; only information regarding the strata characteristics and number of discharges was required for this analysis.

Definition of strata

Although 108 unique strata potentially can be defined on the basis of the characteristics shown in Table B-1, not all strata actually existed in the AHA universe. With respect to the HCUP-2 database, some existing AHA strata contained no hospitals throughout the 1980-87 period; other AHA strata contained no hospitals for individual years. The method used in developing weights required that empty strata be eliminated by collapsing categories of the stratifying characteristics. Because the HCUP-2 database underrepresents investor-owned hospitals (because of difficulties in obtaining cooperation from this sector), investor-owned and voluntary hospitals were collapsed into a single category, resulting in only two dimensions of ownership: public and private. In addition, it was decided that hospitals that change their stratum classification from year to year are probably more representative of their new stratum; thus, their weighting factor was altered accordingly and could vary over time.

Computation of discharge weights

Stratum weights were computed by dividing the number of AHA discharges from the universe of hospitals in each stratum by the number of discharges reported in the AHA survey for HCUP-2 sample hospitals. Note that the discharge weight is based on the number of discharges reported to AHA rather than the number of discharges present in the HCUP database. This approach was used to maintain consistency between the numerator and the denominator.

For any hospital that did not provide discharge data to HCUP during a period that AHA data showed the hospital to be in operation, a reporting adjustment was computed to inflate the number of available discharges for purposes of deriving weights. After the reporting adjustment was computed, some hospitals had large unadjusted-to-adjusted differences in discharge weights. A zero weight was assigned to eight hospital-years (eight different hospitals, one year each) that had unadjusted-to-adjusted weight ratios of 12 or greater.

For five hospital-years (three hospitals for one year each, one hospital for two years), data are available in HCUP-2 but no corresponding data are available from the AHA database. These hospital-years were given a zero weight because the number of AHA discharges, which is critical to computing the weights, cannot be imputed.

In order to identify major discrepancies between the two data sources, the ratio of annual AHA-reported discharges to the number of annual discharges contributed to HCUP-2 on a hospital-by-hospital basis was examined for each year. AHA-to-HCUP ratios fell outside the range of 0.7-1.3 for 55 hospital-years. All hospitals with an AHA-to-HCUP ratio of more than 3.5 were assigned a weight of zero (10 hospital-years, representing four hospitals). When individual

hospitals were given a zero weight, the weights of the remaining hospitals in the stratum were readjusted upward to represent the universe of hospitals.

Validity of HCUP discharge weights

In order to evaluate the validity of discharge estimates obtained from HCUP data using the newly created discharge weights, weighted discharge estimates from HCUP were compared with estimates from the National Hospital Discharge Survey (NHDS). Because the largest dropout of hospitals in HCUP occurred during 1987, a comparison for 1987 should provide the most conservative basis for assessing the validity of the weights. Table B-2 summarizes the differences between NHDS and HCUP in sampling and methods.

For comparison purposes, both 1987 and 1988 NHDS estimates were employed. The 1987 NHDS estimates were used because they correspond temporally to the 1987 HCUP discharge estimates. NHDS estimates for 1988 were also used because the methodology for NHDS was changed in that year in an attempt to provide more representative estimates of national discharges.[1] NHDS estimates are provided for the top 85 diagnosis categories, based on principal diagnosis. NHDS estimates were aggregated into categories using the classification system described in Elixhauser, Andrews, and Fox (1993).

Table B-3 describes the total number of U.S. hospital discharges as estimated from all three sources: NHDS for 1987 and 1988, HCUP-2 for 1987. NHDS estimates in this table were derived from National Center for Health Statistics annual summaries, in which newborns are reported separately from other hospital discharges (Graves, 1989a, 1991a). Ratios of NHDS to HCUP discharges are provided as an indication of how closely HCUP figures approximate NHDS figures. Values close to 1 indicate a high degree of correspondence between the data sources.

Table B-4 provides this comparison on a diagnosis-specific basis using data from detailed National Center for Health Statistics publications (Graves, 1989b, 1991b). This table shows the estimated number of discharges for all three data sources as well as the ratios of NHDS discharges to HCUP discharges. Ratios less than 1 indicate that NHDS discharge estimates are lower than HCUP estimates; ratios of more than 1 indicate that NHDS estimates are higher. In the following discussions of particular diagnosis categories, the numbers refer to the rank among all HCUP discharges (column 1).

Three diagnosis categories containing delivery and newborn codes—normal delivery/liveborn (rank 1), complications of birth, puerperium (rank 2), and complications during pregnancy (rank 4)—are higher in HCUP than in NHDS. The primary reason for this difference is that NHDS does not allow ICD-9-CM codes 640-643[2] and 645-676[3] to appear as a first-listed diagnosis when birth occurred during the hospitalization; HCUP does not impose this restriction. Acute myocardial infarction (rank 12) is overestimated in NHDS compared with HCUP, probably because NHDS reassigns some discharges with myocardial infarction in any diagnosis field to the principal diagnosis. Among the top 85 diagnosis categories, the following 12 additional categories showed considerable discrepancy between HCUP and NHDS estimates for both years (ratios less than 0.8 or more than 1.2): maintenance chemotherapy, radiotherapy (rank 18); diabetes mellitus (rank 19); epilepsy, convulsions (rank 32); abdominal pain (rank 40); other female genital disorders (rank 42); cancer of bronchus, lung, trachea, larynx (rank 43); syncope (rank 50); anemias (rank 56); pleurisy, pneumothorax, and pulmonary collapse (rank 63); hypertension (rank 64); other eye disorders (rank 73); and other and ill-defined heart disease (rank 82).

Mean ratios of groups of disease categories are reported in Table B-5 to provide a summary measure of how closely HCUP and NHDS correspond. In general, there appears to be better correspondence between HCUP and the 1988

[1] Despite differences in the methodologies, comparison of the 1987 and 1988 NHDS estimates revealed few statistically significant differences in the number of discharges (Haupt and Kozack, 1992).

[2] The ICD-9-CM codes are hemorrhage (640, 641), hypertension (642), and vomiting (643) in pregnancy.

[3] The ICD-9-CM codes are prolonged pregnancy (645), infections (647), and other complications in pregnancy (646, 648); normal delivery (650); multiple gestation (651); malposition (652); disproportion (653); pelvic soft tissue abnormalities (654); other fetal, placental, and amniotic problems (655-658); other indications for care (659); obstructed and other abnormal labor (660-662); umbilical cord complications (663); obstetrical trauma (664, 665); postpartum hemorrhage (666); retained placenta (667); obstetrical procedure complications (668, 669); and complications of the puerperium (670-676).

NHDS estimates. Because of differences in how delivery and myocardial infarction codes are handled in the two databases, mean ratios are compared both excluding the three delivery categories and excluding the delivery and myocardial infarction categories. The mean ratios for the most frequent diagnosis categories (top 50, top 25, and top 10) are also compared. In general, there is excellent correspondence between the 1987 estimates from HCUP-2 and the 1988 NHDS estimates, which were based on a sampling strategy that was revised to provide more representative estimates.

Table B-1
Hospital characteristics and dimensions

Characteristic	Dimensions		
Geographic region	Northeast North Central West South		
Location/teaching status	Rural Urban/nonteaching Urban/teaching		
Type of control	Public Investor-owned Voluntary		
Number of beds	Rural	Urban/ nonteaching	Urban/ teaching
	Small 30-85	30-145	30-325
	Medium 86-175	146-290	326-575
	Large . . . . . 176 or more	291 or more	576 or more

Table B-2
Differences between NHDS and HCUP-2 samples and methods

NHDS	HCUP-2
Includes hospitals with 6 beds or more: 6,965 hospitals in sampling frame	Includes hospitals with 30 beds or more: 5,050 hospitals in sampling frame
Includes some specialty hospitals: obstetrics-gynecology; ear, nose, and throat; orthopedic; and children's	No specialty hospitals included
Sample of discharges from each hospital: ≈ 181,000 abstracts/year	Census of discharges from each hospital: ≈ 4 million abstracts/year
3-stage stratified sample with sampling proportional to size: ≈ 400 hospitals	Sample stratified by bed size, ownership, teaching status, and urban/rural location: ≈ 664 hospitals
Reassigns myocardial infarction to principal diagnosis when other circulatory diagnoses are present	No reassignment of any codes
Does not accept certain codes that are not "legal" first-listed diagnoses, e.g., ICD-9-CM codes 640-643 and 645-676 cannot be listed first when birth occurred during the hospitalization	Accepts all codes

Note: HCUP-2 is Hospital Cost and Utilization Project, 1980-87; ICD-9-CM is International Classification of Diseases, 9th Revision, Clinical Modification; NHDS is National Hospital Discharge Survey.

Table B-3
Estimated total U.S. hospital discharges: NHDS, 1987 and 1988, and HCUP-2, 1987

Item	1987 NHDS	1988 NHDS	1987 HCUP-2	1987 NHDS: 1987 HCUP-2	1988 NHDS: 1987 HCUP-2
	Discharges in thousands			Ratio	
Discharges (except newborns)	33,387	31,146	—	—	—
Newborns	3,971	3,733	—	—	—
Total discharges (including newborns)	37,358	34,879	33,713	1.11	1.03

Note: HCUP-2 is Hospital Cost and Utilization Project, 1980-87; NHDS is National Hospital Discharge Survey. HCUP-2 estimates are compared with both 1987 and 1988 estimates from NHDS because the NHDS sample was restructured in 1988 to be more representative of the universe of U.S. hospitals.

Table B-4
Comparison of national estimates of discharges based on HCUP-2, 1987, and NHDS, 1987 and 1988

Rank in HCUP		Diagnosis category[1]	1987 NHDS	1988 NHDS	1987 HCUP-2	1987 NHDS: 1987 HCUP-2	1988 NHDS: 1987 HCUP-2
			Discharges in thousands			Ratio	
1	150.	Normal delivery/liveborn	3,958	3,807	4,392	0.90	0.87
2	149.	Complications of birth, puerperium	88	55	2,265	0.04	0.02
3	84.	Ischemic heart disease	1,491	1,430	1,617	0.92	0.88
4	148.	Complications during pregnancy	504	485	911	0.55	0.53
5	100.	Pneumonia and influenza	953	969	879	1.08	1.10
6	90.	Cerebrovascular disease	894	784	808	1.11	0.97
7	170.	Other fractures, not hip	810	750	784	1.03	0.96
8	89.	Congestive heart failure	629	663	685	0.92	0.97
9	101.	Other respiratory infections (not tuberculosis)	769	717	688	1.12	1.04
10	161.	Spondylosis, intervertebral disc disorders, cervical disorders, other back pain	846	705	681	1.24	1.03
11	125.	Biliary tract disease	636	574	581	1.09	0.99
12	83.	Acute myocardial infarction	760	716	549	1.39	1.31
13	175.	Complication of device or procedure	464	491	498	0.93	0.99
14	88.	Conduction disorders, dysrhythmias	583	556	493	1.18	1.13
15	61.	Depression and affective disorders	523	576	473	1.11	1.22
16	57.	Alcohol-related disorders	484	359	407	1.19	0.88
17	103.	Asthma	454	479	407	1.11	1.18
18	40.	Maintenance chemotherapy, radiotherapy	90	180	384	0.23	0.47
19	46.	Diabetes mellitus	489	467	381	1.28	1.23
20	134.	Urinary tract infection	428	436	371	1.16	1.18
21	120.	Noninfectious enteritis and colitis	422	367	353	1.20	1.04
22	135.	Calculus of urinary tract	335	311	344	0.97	0.90
23	49.	Fluid and electrolyte disorders	357	379	326	1.10	1.16
24	151.	Skin and subcutaneous infections	322	311	298	1.08	1.04
25	137.	Hyperplasia of prostate	274	247	285	0.96	0.87
26	168.	Fracture of neck of femur (hip)	253	254	261	0.97	0.97
27	118.	Inguinal hernia	301	257	266	1.13	0.97
28	147.	Pregnancy with abortive outcome	301	263	265	1.14	0.99

See note at end of table.

Table B-4—Continued
Comparison of national estimates of discharges based on HCUP-2, 1987, and NHDS, 1987 and 1988

Rank in HCUP		Diagnosis category[1]	1987 NHDS	1988 NHDS	1987 HCUP-2	1987 NHDS: 1987 HCUP-2	1988 NHDS: 1987 HCUP-2
			Discharges in thousands			Ratio	
29	38.	Secondary malignancies	198	234	244	0.81	0.96
30	178.	Poisoning	233	193	245	0.95	0.79
31	117.	Appendicitis	274	234	237	1.15	0.99
32	73.	Epilepsy, convulsions	137	131	232	0.59	0.56
33	116.	Gastritis, upper gastrointestinal obstruction, nausea	227	189	232	0.98	0.82
34	143.	Menstrual disorders and ovarian cyst	276	234	227	1.22	1.03
35	174.	Open wounds	249	196	226	1.10	0.87
36	172.	Intracranial injury (not fracture)	241	202	218	1.11	0.93
37	121.	Intestinal obstruction without hernia	223	201	213	1.05	0.94
38	102.	Chronic obstructive pulmonary disease and allied conditions	358	235	209	1.71	1.12
39	160.	Osteoarthritis	231	205	207	1.11	0.99
40	130.	Abdominal pain	79	69	203	0.39	0.34
41	171.	Sprains and strains	254	182	202	1.26	0.90
42	146.	Other female genital disorders	275	136	193	1.43	0.71
43	16.	Cancer of bronchus, lung, trachea, larynx	298	233	187	1.59	1.25
44	42.	Other benign neoplasms	190	189	181	1.05	1.04
45	41.	Benign neoplasm, uterus	186	190	179	1.04	1.06
46	140.	Inflammation of female pelvic organs	197	164	174	1.13	0.94
47	128.	Gastrointestinal hemorrhage	204	175	171	1.19	1.02
48	107.	Other lower respiratory diseases	190	235	165	1.15	1.43
49	59.	Schizophrenic disorders	185	177	173	1.07	1.02
50	95.	Syncope	21	30	164	0.13	0.18
51	122.	Diverticulosis and diverticulitis	173	166	165	1.05	1.01
52	20.	Cancer of breast	205	175	163	1.26	1.07
53	2.	Septicemia	172	193	157	1.09	1.23
54	12.	Cancer of colon-rectum	196	161	161	1.22	1.00
55	136.	Other genitourinary disorders	176	134	159	1.11	0.85
56	51.	Anemias	212	195	155	1.37	1.26
57	119.	Other abdominal hernia	175	142	152	1.15	0.93
58	6.	Viral infections	176	169	152	1.16	1.11
59	96.	Thrombophlebitis and thromboembolism	170	142	154	1.11	0.92
60	167.	Joint disorders, trauma-related	169	152	154	1.10	0.99
61	58.	Drug disorders, not alcohol-related	197	150	144	1.37	1.04
62	165.	Congenital anomalies	238	138	145	1.65	0.96
63	105.	Pleurisy, pneumothorax, pulmonary collapse	111	103	146	0.76	0.71
64	82.	Hypertension	302	267	147	2.06	1.82
65	80.	Other nervous system disorders	218	116	143	1.52	0.81
66	142.	Prolapse of female genital organs	146	125	141	1.04	0.89
67	179.	Other external injury	156	97	139	1.12	0.70
68	127.	Pancreas disorders (not diabetes)	136	128	136	1.00	0.94
69	162.	Osteoporosis and other disorders of bone and cartilage	190	152	135	1.41	1.13
70	158.	Other joint disorders (not trauma)	130	107	134	0.97	0.80
71	109.	Intestinal infections	135	144	126	1.07	1.14
72	112.	Esophageal disorders	145	147	122	1.19	1.20
73	76.	Other eye disorders	163	162	122	1.33	1.32
74	113.	Gastric ulcer	111	114	114	0.98	1.00
75	25.	Cancer of prostate	128	123	112	1.14	1.10
76	141.	Endometriosis	108	99	113	0.96	0.88
77	166.	Perinatal conditions	107	138	110	0.97	1.25

See note at end of table.

Table B-4—Continued
Comparison of national estimates of discharges based on HCUP-2, 1987, and NHDS, 1987 and 1988

Rank in HCUP		Diagnosis category[1]	1987 NHDS	1988 NHDS	1987 HCUP-2	1987 NHDS: 1987 HCUP-2	1988 NHDS: 1987 HCUP-2
			Discharges in thousands			Ratio	
78	91.	Atherosclerosis (not heart or brain)	120	129	115	1.05	1.13
79	114.	Duodenal ulcer	109	99	109	1.00	0.91
80	180.	Indications for plastic surgery	111	96	108	1.03	0.89
81	173.	Internal injury to viscera or vessels, crushing injury	106	74	108	0.98	0.69
82	86.	Other and ill-defined heart disease	126	122	102	1.24	1.20
83	108.	Other upper respiratory diseases	87	83	101	0.86	0.82
84	176.	Superficial injury, contusion	106	85	98	1.08	0.87
85	138.	Other male genital disorders	120	85	97	1.23	0.87

[1] For a description of diagnosis codes comprising each diagnosis category, refer to Elixhauser, Andrews, and Fox (1993).

Note: HCUP-2 is Hospital Cost and Utilization Project, 1980-87; NHDS is National Hospital Discharge Survey.

Table B-5
Correspondence between NHDS and HCUP-2 estimates for discharges from U.S. hospitals

Estimate	1987 NHDS: 1987 HCUP-2	1988 NHDS: 1987 HCUP-2
	Ratio	
All diagnosis categories	1.10	0.96
All categories excluding delivery categories	1.12	0.98
All categories excluding delivery categories and myocardial infarction	1.12	0.97
Top 50 categories excluding delivery categories and myocardial infarction	1.06	0.96
Top 25 categories excluding delivery categories and myocardial infarction	1.05	1.01
Top 10 categories excluding delivery categories and myocardial infarction	1.06	0.99

Note: HCUP-2 is Hospital Cost and Utilization Project, 1980–87; NHDS is National Hospital Discharge Survey. Delivery categories are normal delivery/liveborn; complications during pregnancy; and complications of birth, puerperium.

Appendix C
Standardization

When comparing the morbidity or mortality experience of different population groups, it is possible for comparisons to be biased by differences among the populations in the distribution of certain underlying characteristics. For example, because age and sex are important determinants of morbidity and mortality, variations in the age or sex composition of different populations can dramatically influence comparisons of these rates. Therefore, when comparing morbidity or mortality experience among population groups, it is advisable to control for the potential influence of such factors either in the design or analysis of the study. Among the options available for controlling for extraneous factors at the time of the analysis is standardization of rates (Mausner and Kramer, 1985).

With the direct method of standardization, the observed data from each comparison group (e.g., black persons and white persons) are initially stratified on the basis of different categories of the characteristics that are to be controlled (e.g., age and sex). The observed stratum-specific rates for the outcome of interest (e.g., the procedure rate) are then determined. For each comparison group, the observed stratum-specific rates are multiplied by the total number of individuals within similarly defined strata of a standard population. The results of these calculations represent the expected number of occurrences of the outcome in the standard population, had the observed stratum-specific rates of the comparison groups prevailed.

Typically, for each comparison group, the expected number of occurrences of the outcome is summed over all strata and divided by the total number of subjects in the standard population to yield an overall "adjusted" rate. The adjusted rate is expressed in units comparable with the original measure (e.g., procedures per 100,000 population or discharges per 100,000 population). Because the observed stratum-specific rates for each comparison group have been applied to the same standard population, variations in the composition of the comparison groups relative to the stratification variables do not influence the comparison of the overall adjusted rates.

The choice of the standard population is not critical. It could represent the combination of the comparison groups, or it could be derived from U.S. or State vital statistics data; or it could, for that matter, be artificially constructed. However, it is important to note that the magnitude of the adjusted rates is not invariant to the choice of population standard; therefore, one set of adjusted rates should not be compared with another set of rates adjusted on the basis of a different standard population. In this investigation, U.S. Bureau of the Census data for 1970 were used as the standard in computing all adjusted rates. An example of age standardization of rates is provided in Table C-1, illustrating the potential impact of this methodology.

This hypothetical example demonstrates how it is possible for apparent differences between groups based on a comparison of crude overall rates (33,270 versus 7,370 deaths per 100,000 population) to disappear when the comparison is based on adjusted rates (908 versus 908 deaths per 100,000 population). When the observed stratum-specific rates for each comparison group were applied to the same standard population, variations in the composition of the comparison groups relative to age did not influence the comparison of the overall adjusted rates. It is also possible for true differences between populations to be masked when comparisons are based solely on crude rates. In this case, only after adjustment do differences become apparent.

Table C-1
Hypothetical example of standardization of mortality rates by age

Age group	Observed population A			Observed population B			Standard population	Expected deaths	
	Number of deaths	Population size	Death rate[1]	Number of deaths	Population size	Death rate[1]		Population A	Population B
5 years and under	75	3,000	2,500	2,000	80,000	2,500	10,000	250	250
6-10 years	85	17,000	500	850	170,000	500	30,000	150	150
11-20 years	50	50,000	100	180	180,000	100	80,000	80	80
21-30 years	160	80,000	200	320	160,000	200	160,000	320	320
31-40 years	480	120,000	400	560	140,000	400	220,000	880	880
41-50 years	840	140,000	600	720	120,000	600	220,000	1,320	1,320
51-60 years	1,280	160,000	800	640	80,000	800	160,000	1,280	1,280
61-70 years	1,800	180,000	1,000	500	50,000	1,000	80,000	800	800
71-80 years	8,500	170,000	5,000	850	17,000	5,000	30,000	1,500	1,500
81 years and over	20,000	80,000	25,000	750	3,000	25,000	10,000	2,500	2,500
Total population	—	1,000,000	—	—	1,000,000	—	1,000,000	—	—
Total observed deaths	33,270	—	—	7,370	—	—	—	—	—
Observed rate[1]	—	—	3,327	—	—	737	—	—	—
Total expected deaths	—	—	—	—	—	—	—	9,080	9,080
Adjusted rate[1]	—	—	—	—	—	—	—	908	908

[1] Rate per 100,000 population.

Appendix D
Recalculation of confidence interval estimates

Because of the large number of statistical comparisons included in this report, there is an increased likelihood of identifying significant differences that are due to chance alone. This could have been mitigated by using a more conservative alpha level. However, in light of the exploratory nature of this investigation, a 0.05 alpha level was used in constructing confidence intervals about the point estimates shown in the tables. This appendix provides the formulae necessary to construct more restrictive confidence interval estimates (CIEs) for assessing differences.

Standard error for a rate

The CIEs for the rates were based on the usual method of derivation: Rate ± 1.96 × (standard error [SE] of the rate). To recalculate confidence intervals, simply set the above equation equal to the lower limit of the CIE and solve for the SE as shown below; the value for the rate is obtained directly from the table entries.

$$SE(\text{rate}) = \frac{(\text{lower limit CIE}) - (\text{rate})}{-1.96}$$

Standard error for EAPC

The estimated annual percent change (EAPC) is derived by fitting a regression line to the natural logarithm of the procedure rates, using calendar year as the independent variable. The equation for calculating the EAPC is given below, where m is the slope of the regression line:

$$EAPC = 100 \times (\exp^{m} - 1)$$

The value of the slope may therefore be obtained as the solution to the following equation:

$$m = \ln\left[1 + \frac{EAPC}{100}\right]$$

The lower limit of the confidence interval is calculated in the following manner:

$$\text{Lower limit CIE} = 100 \times \left(\exp^{m - 1.96\,(SE(m))} - 1\right)$$

The standard error of the slope can be derived from the above equation as follows:

$$SE(m) = \frac{\left[\ln\left(1 + \frac{\text{lower limit CIE}}{100}\right)\right] - m}{-1.96}$$

Example

These equations could easily be programmed into a spreadsheet software package to recalculate CIEs for a number of different procedures. An example of the steps necessary to recalculate the confidence interval is given below, using the EAPC and associated confidence interval for procedure category 1 (incision and excision of central nervous system) among white patients (EAPC = 1.8; 95-percent CIE = 0.2, 3.4).

$$m = \ln\left[1 + \frac{EAPC}{100}\right] = \ln\left[1 + \frac{1.8}{100}\right] = 0.0178$$

$$SE(m) = \frac{\left[\ln\left(1 + \frac{11\ CIE}{100}\right)\right] - m}{-1.96}$$

$$= \frac{\left[\ln\left(1 + \frac{0.2}{100}\right)\right] - 0.0178}{-1.96}$$

$$= 0.0081$$

Substitution of the derived values of the slope (m) and its SE along with a different alpha level into the equation below enables a more restrictive confidence interval to be calculated. An example is provided below for constructing a confidence interval corresponding to a two-tailed test with alpha equal to 0.005 ($Z_{\frac{\alpha}{2}} = 2.81$).

$$CIE = 100 \times \left(\exp^{m \pm Z_{\frac{\alpha}{2}}(SE(m))} - 1\right)$$

$$= 100 \times (\exp^{0.0178 \pm 2.81 \times (0.0081)} - 1)$$

$$= (-0.5, 4.1)$$

Provider Studies Research Notes

No.	Title (Author) and Order Number	Date
1	Project Overview (Hornbrook) NTIS Accession No. PB84-111566	June 1983
2	Patients in Public General Hospitals: Who Pays, How Sick? (Coffey) PHS Pub. No. 83-3344	Sept. 1983
3	Characteristics of Financially Distressed Hospitals (Kelly and O'Brien) NTIS Accession No. PB84-111574	June 1983
4	Who Receives Cesareans: Patient and Hospital Characteristics (Goldfarb) NTIS Accession No. PB85-124766	Sept. 1984
5	Sole Community Hospitals: Are They Different? (Farley) PHS Pub. No. 85-3348	Mar. 1985
6	Utilization of Hospital Inpatient Services by Elderly Americans (Garnick and Short) PHS Pub. No. 85-3351	June 1985
7	Competition Among Hospitals: Market Structure and Its Relation to Utilization, Costs, and Financial Position (Farley) PHS Pub. No. 85-3353	Aug. 1985
8	Use of Short-Term General Hospitals by Patients With Psychiatric Diagnoses (Wallen) PHS Pub. No. 86-3395	Oct. 1985
9	Case Mix and Treatment Patterns of Medicaid and Privately Insured Psychiatric Patients in Short-Term General Hospitals (Wallen) PHS Pub. No. 87-3402	Oct. 1986
10	HCUP-2 Project Overview (Coffey and Farley) PHS Pub. No. 88-3428	July 1988
11	Trends in Hospital Average Lengths of Stay, Casemix, and Discharge Rates, 1980-85 (Farley) PHS Pub. No. 88-3420	Apr. 1988
12	Urban and Rural Hospital Costs: 1981-85 (Hogan) PHS Pub. No. 88-3419	Apr. 1988
13	The 50 Most Frequent Diagnosis-Related Groups (DRGs), Diagnoses, and Procedures: Statistics by Hospital Size and Location (Lemrow and others) PHS Pub. No. 90-3465	Sept. 1990
14	Financially Distressed Hospitals: A Profile of Behavior Before and After PPS (Rizzo) PHS Pub. No. 90-3467	Sept. 1990
15	AIDS in U.S. Hospitals, 1986-87: A National Perspective (Ball and Turner) AHCPR Pub. No. 91-0015	July 1991
16	Pediatric AIDS-Related Discharges in a Sample of U.S. Hospitals: Demographics, Diagnoses, and Resource Use (Ball and Thaul) AHCPR Pub. No. 92-0031	Feb. 1992
17	Clinical Classifications for Health Policy Research: Discharge Statistics by Principal Diagnosis and Procedure (Elixhauser and others) AHCPR Pub. No. 93-0043	Aug. 1993
18	Intermittent Positive Pressure Breathing: Old Technologies Rarely Die (Duffy and Farley) AHCPR Pub. No. 94-0001	Dec. 1993
19	The National Bill for Diseases Treated in U.S. Hospitals: 1987 (Andrews and others) AHCPR Pub. No. 94-0002	Feb. 1994
20	Trends in Hospital Procedures Performed on Black Patients and White Patients: 1980-87 (Elixhauser and others) AHCPR Pub. No. 94-0003	Apr. 1994

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